Strata® CTX

Digital Business Telephone Systems

CTX100 and CTX670
General Description

Strata CTX100 and CTX670 General End User Information

The Strata CTX100 or CTX670 Digital Business Telephone System is registered in accordance with the provisions of Part 68 of the Federal Communications Commission's Rules and Regulations.

FCC Requirements

Means of Connection: The Federal Communications Commission (FCC) has established rules which permit the Strata CTX100 or CTX670 system to be connected directly to the telephone network. Connection points are provided by the telephone company—connections for this type of customer-provided equipment will not be provided on coin lines. Connections to party lines are subject to state tariffs.

Incidence of Harm: If the system is malfunctioning, it may also be disrupting the telephone network. The system should be disconnected until the problem can be determined and repaired. If this is not done, the telephone company may temporarily disconnect service. If possible, they will notify you in advance, but, if advance notice is not practical, you will be notified as soon as possible. You will be informed of your right to file a complaint with the FCC.

Service or Repair: For service or repair, contact your local Toshiba telecommunications distributor. To obtain the nearest Toshiba telecommunications distributor in your area, log onto www.toshiba.com/taistsd/locator.htm or call (800) 222-5805 and ask for a Toshiba Telecom Dealer.

Telephone Network Compatibility: The telephone company may make changes in its facilities, equipment, operations, and procedures. If such changes affect the compatibility or use of the Strata CTX100 or CTX670 system, the telephone company will notify you in advance to give you an opportunity to maintain uninterrupted service.

Notification of Telephone Company: Before connecting a Strata CTX100 or CTX670 system to the telephone network, the telephone company may request the following:

1. Your telephone number.
2. FCC registration number:
   - Strata CTX100 or CTX670 may be configured as a Key, Hybrid or PBX telephone system. The appropriate configuration for your system is dependent upon your operation of the system.
   - If the operation of your system is only manual selection of outgoing lines, it may be registered as a Key telephone system.
   - If your operation requires automatic selection of outgoing lines, such as dial access, Least Cost Routing, Pooled Line Buttons, etc., the system must be registered as a Hybrid telephone system. In addition to the above, certain features (tie Lines, Off-premises Stations, etc.) may also require Hybrid telephone system registration in some areas.
   - If you are unsure of your type of operation and/or the appropriate FCC registration number, contact your local Toshiba telecommunications distributor for assistance.
     CTX100 Registration Numbers
     PBX: CJ6MUL-35931-PF-E, fully-protected PBXs
     Hybrid: CJ6MUL-35930-MF-E, fully-protected multifunction systems
     Key: CJ6MUL-35929-KF-E, fully-protected telephone key systems
   - **CTX670 Registration Numbers**
     PBX: CJ6MUL-35934-PF-E, fully-protected PBXs
     Hybrid: CJ6MUL-35933-MF-E, fully-protected multifunction systems
     Key: CJ6MUL-35932-KF-E, fully-protected telephone key systems
   - Ringer equivalence number: 0.3B. The ringer equivalence number (REN) is useful to determine the quantity of devices which you may connect to your telephone line and still have all of those devices ring when your number is called. In most areas, but not all, the sum of the RENs of all devices connected to one line should not exceed five (5.0B). To be certain of the number of devices you may connect to your line, as determined by the REN, you should contact your local telephone company to ascertain the maximum REN for your calling area.
3. Network connection information USOC jack required: RJ11/14C, RJ21/2E/2F/2G/2HX/RJ49C (see Network Requirements in this document). Items 2, 3 and 4 are also indicated on the equipment label.
4. Authorized Network Parts: 02LS2/GS2, 02RV2-T/O, OL13C/B, T11/12/31/32M, 04DU9-BN/DN/1SN, 02IS5, 04DU9-BN/DN/1SN1ZN

Radio Frequency Interference

Warning: This equipment generates, uses, and can radiate radio frequency energy and if not installed and used in accordance with the manufacturer's instruction manual, may cause interference to radio communications. It has been tested and found to comply with the limits for a Class A computing device pursuant to Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference, in which case, the user, at his/her own expense, will be required to take whatever measures may be required to correct the interference.

This system is listed with Underwriters Laboratory.

UL Requirement: If wiring from any telephone exits the building or is subject to lightning or other electrical surges, then secondary protection is required. Secondary protection is also required on DID, OPS, and Tie lines. (Additional information is provided in this manual.)

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CP01, Issue 8, Part I Section 14.1
Notice: The Industry Canada label identifies certified equipment. This certification means that the equipment meets certain telecommunications network protective, operational and safety requirements as prescribed in the appropriate Terminal Equipment Technical Requirements document(s). The Department does not guarantee the Equipment will operate to the user's satisfaction.

Before installing this equipment, users should ensure that it is permissible to be connected to the facilities of the local telecommunications company. The equipment must also be installed using an acceptable method of connection. The customer should be aware that compliance with the above conditions may not prevent degradation of service in some situations.

Repairs to certified equipment should be coordinated by a representative designated by the supplier. Any repairs or alterations made by the user to this equipment, or equipment malfunctions, may give the telecommunications company cause to request the user to disconnect the equipment.

Users should ensure for their own protection that the electrical ground connections of the power utility, telephone lines and internal metallic water pipe system, if present, are connected together. This precaution may be particularly important in rural areas.

CAUTION! Users should not attempt to make such connections themselves, but should contact the appropriate electric inspection authority, or electrician, as appropriate.

CP01, Issue 8, Part I Section 14.2
Notice: The Ringer Equivalence Number (REN) assigned to each terminal device provides an indication of the maximum number of terminals allowed to be connected to a telephone interface. The terminal on an interface may consist of any combination of devices subject only to the requirement that the sum of the Ringer Equivalence Numbers of all the Devices does not exceed 5.

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Introduction

This General Description provides an overview of the Strata CTX100 and CTX670 digital business telephone systems, associated hardware and features.

Organization

This document is divided into the following major topics:

- **Chapter 1 – Strata CTX100 Overview** describes the system, its basic capacities and system expansion.
- **Chapter 2 – Strata CTX670 Overview** describes the system, its basic capacities, system expansion, and remote maintenance.
- **Chapter 3 – Capacities** includes Strata CTX100 and CTX670 capacities for stations and peripherals, Central Office (CO) lines, station buttons and system features.
- **Chapter 4 – Universal Slot PCBs** provides information about Printed Circuit Boards (PCBs) that can be installed in the universal slots of the Strata CTX systems.
- **Chapter 5 – Telephones and Peripherals** describes the most recent Toshiba-proprietary stations and peripherals, customer-supplied peripherals, as well as cabling and connectors.
- **Chapter 6 – Features** describes the features which are available system-wide, as well as stations features.
- **Appendix – Specifications** includes detailed information on environmental characteristics, power considerations, hardware compatibility, network requirements, and station specifications.

Conventions

Conventions	Description
Note	Elaborates specific items or references other information. Within some tables, general notes apply to the entire table and numbered notes apply to specific items.
Important!	*Calls attention to important instructions or information.*
`Courier`	Shows a computer keyboard entry or screen display.
"Type"	Indicates entry of a string of text.
"Press"	Indicates entry of a single key. For example: Type **`prog`** then press **`Enter`**.
Plus (+)	Shows a multiple PC keyboard or phone button entry. Entries without spaces between them show a simultaneous entry. Example: **`Esc`**+**`Enter`**. Entries with spaces between them show a sequential entry. Example: **`#`** + **`5`**.
Tilde (~)	Means "through." Example: 350 ~ 640 Hz frequency range.
➤	Denotes the step in a one-step procedure.
➤	Denotes a procedure.
Start > Settings > Printers	Denotes a progression of buttons and/or menu options on the screen you should select.
See Figure 10	Grey words within the printed text denote cross-references. In the electronic version of this document (Library CD-ROM or FYI Internet download), cross-references appear in blue hypertext.

Related Documents/Media

Installation and Programming

- Strata CTX Installation & Maintenance Manual
- Strata CTX Programming Manual

User Guides

- DKT3000/2000-series Digital Telephone
- DKT3001/2001 Digital Single Line Telephone
- Standard Telephone
- DKT2104-CT Cordless Telephone
- DKT2004-CT Cordless Telephone

Quick Reference Guide

- DKT3000/2000-series Digital Telephone

CD-ROMs

- Strata CTX WinAdmin Application Software and Documentation Library
- Strata CTX Quote
- Strata CTX ACD Application Software and CTX Documentation Library (includes Strata CTX ACD software and documentation, Net Server software and documentation, and Voice Assistant software and documentation)
- OAISYS (includes software and documentation for OAISYS Chat, Call Router, and Net Phone)

For *authorized users*, Internet site FYI (http://fyi.tsd.toshiba.com) contains all current Strata CTX documentation and enables you to view, print and download current publications.

Strata CTX100 Overview 1

The Strata CTX100 is a compact system that provides large system features (see Figure 1). It is designed for wall mounting and occupies very little space.

The CTX100 basic processor can be configured with a one or two cabinet system. A single (Base) cabinet system supports a combination of up to 64 Central Office (CO) lines and stations, while a two (Base and Expansion) cabinet system can support up to 112 CO lines and stations.

System line and station capacity is expanded by adding CO line and station Printed Circuit Boards (PCBs) into its universal slot architecture.

The CTX100 easily connects to outside public and private telephone lines. All of the telephones (stations) tied to the system can have direct access to each other, as well as to the public and private network.

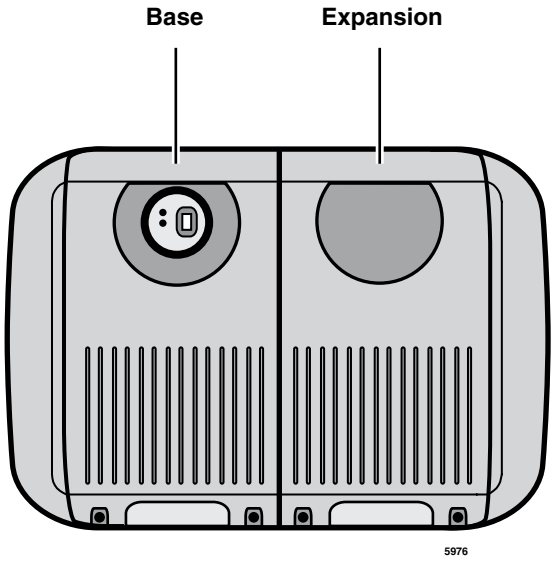


Figure 1 CTX100 Base/Expansion Cabinets

Each CTX100 system has a Base Cabinet with one optional Expansion Cabinet. All lines, stations, and options are tied together through the cabinets. The overall weight and dimensions of the CTX100 cabinets are shown in Table 1.

Table 1 CTX100 Cabinet Specifications

Cabinet	Weight[1]	Height	Width	Depth
Base Cabinet (CHSUB112)	19.4 lbs.	14.6 in.	11.9 in.	10.2 in.
Base + Expansion Cabinet (CHSUE112)	34.6 lbs.	14.6 in.	19.9 in.	10.2 in.

1. Weight includes the processor PCB in the Base Cabinet and four universal PCBs in each cabinet.

CTX100 Processor

The system operates with one processor circuit board (ACTU) that installs in a dedicated slot of the Base Cabinet. The ACTU processor incorporates the following hardware features:

CPU/Memory

The CTX100 uses a high-speed, 32-bit, RISC processor, Dynamic Random Access Memory (DRAM) working memory, Static Random Access Memory (SRAM) with lithium battery for memory back-up, and flash program memory.

Large Scale Integrated (LSI) Circuits

The processor has LSI circuits that support the following:

- 16 DTMF receivers – requires ARCS and, for five or more DTMF receivers, requires appropriate licenses. See "CTX100 License Control" on page 4.
- 16 Busy Tone (BT) detectors for Auto Busy Redial (ABR) – requires ARCS.
- 64 built-in conference circuits (see Table 7 on page 13 for more information).
- Built-in, adjustable, digital volume PAD technology enables audio volume to be adjusted in eight steps to compensate for conference and/or CO line network losses.

Memory Protection Battery

If commercial AC power is lost or if a system is moved or stored without power, the processor has an on-board battery that protects data and the customer's programmed configuration from memory loss. This information will be maintained in a powerless system for at least six years.

Relay Control Interface

An on-board terminal strip provides an interface to a normally open relay contact which can be programmed to control a Night Bell, door lock or to mute BGM during an external page.

External Page Interface

A 600 ohm RCA jack is built into the processor to interface with a Toshiba External Amplified Speaker (HESB) or a customer-supplied page amplifier and speaker(s) for external paging, night ring over external page, and external BGM applications.

Music-on-hold/Background Music Interface

A 600-ohm RCA jack and volume controls are built into the processor to interface with Music-on-hold and/or Background Music (BGM) sources (one of the jacks is for future use). With the CTX100, you can have up to 15 MOH/BGM source interfaces by adding:

- Up to two BIOU PCBs, each provides three MOH/BGM input sources
- An RSTU PCB that provides up to eight MOH/BGM input sources

SmartMedia Memory

The processor has an on-board SmartMedia™ memory card slot. A SmartMedia flash memory card can be inserted into the slot to backup and restore customer program data. It also makes it easy to upload operating system data for software upgrades and is used for maintenance functions (see "System Fault Finding and Diagnostics" on page 66 for more details).

CTX100 Processor Optional Subassemblies

Optional subassemblies can be attached to the ACTU processor to provide additional features. The subassemblies are:

- **AMDS (Modem**) – Provides a 33.6Kbps/V.34 modem for point-to-point local or remote connection to the CTX WinAdmin administration PC.
- **ARCS (DTMF Receiver/Busy Tone Detector)** – Provides 16 DTMF receivers maximum and 16 Auto Busy Redial (ABR), Busy Tone detectors maximum.
- **AETS (Ethernet LAN Interface)** – Provides one 10baseT Ethernet circuit with an RJ45 connector for CTI Open Architecture applications, CTX Attendant Console, ACD Server, Toshiba Proprietary Voice Mail integration and system administration connection (including local and remote CTX WinAdmin).
- **BSIS (Serial Port Interface)** – Provides up to two RS-232 interface ports for SMDR interface to Call Accounting devices, SMDI or Toshiba Proprietary interface to Voice Mail devices, and two future applications.

CTX100 Cabinet Slots

Base Cabinet

The Base Cabinet has one dedicated slot used for the system processor PCB and four universal slots (S101~S104), that can accommodate station, line or option PCBs. It also houses a power supply that is packaged with the cabinet.

Expansion Cabinets

One expansion cabinet provides four universal PCB slots (S105~S108) that can accommodate station, line or option PCBs. It also houses a power supply that is packaged with the cabinet.

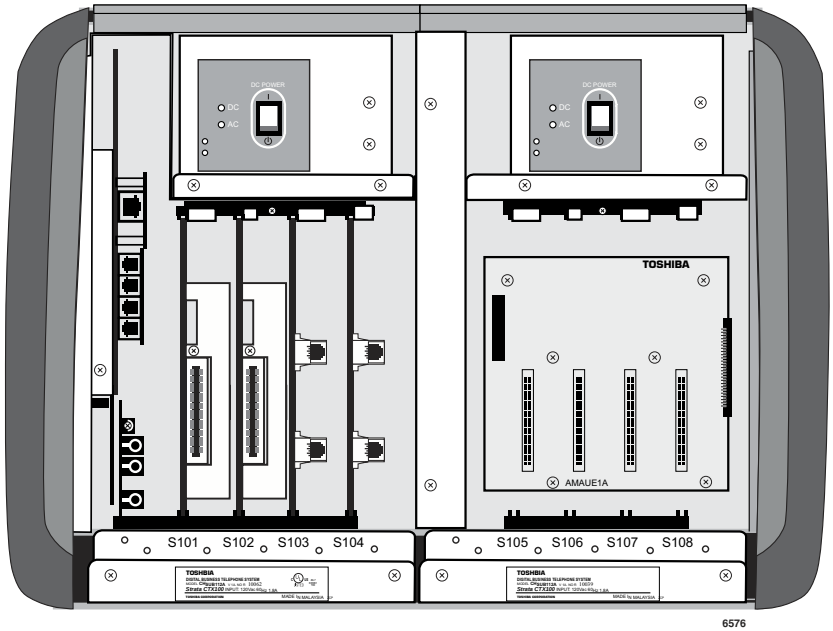


Figure 2 Base and Expansion Cabinet Interior

CTX100 License Control

The system size and feature capability is controlled using a software License Key Code. This key code is obtained from Toshiba Internet FYI during the ordering process and is installed onto the system processor via Strata CTX WinAdmin. Processor license codes activate system hardware capacities in the following increments.

- The first 32 line/station ports do not require a license. Each additional set of four line/station ports requires one LIC100-4 PORTS license (maximum of 112 ports).
- The optional DTMF receiver circuit (ARCS) provides 16 DTMF receiver hardware circuits and 16 ABR circuits. The first four DTMF circuits and *all* ABR circuits do not require a license. Each additional set of four DTMF receiver circuits requires one LIC100-4 DTMF license (maximum of 16 DTMF circuits).

Note DTMF tone receiver circuits are required for standard telephones, Voice Mail DTMF integration, Tie, DID and DNIS line service.

- The optional RS-232 serial port interface (BSIS) provides two circuits to interface with SMDI or Toshiba Proprietary Voice Mail integration, Call Accounting SMDR, and two for future applications. The first circuit does not require a license, but circuits two through four each require one LIC100-SER PORT license.

Licensed Software Options

Some software options are activated with license codes. The following software options require a license:

- Each CTX system (node) in a Strata Net QSIG Network requires one LIC100-QSIG NET license. A maximum of four serial network nodes are allowed in any one serial chain in the network topology.
- The optional AETS PCB provides hardware LAN interface for all CTI Open Architecture applications. Each individual CTI Open Architecture application (future) requires one LIC100-CSTA AP license (maximum nine).

Strata CTX670 Overview 2

The Strata CTX670 system provides sophisticated telecommunication features in a modular system designed for growth. Its universal slot architecture enables you to select the combination of Central Office (CO) lines, stations, and peripheral options that best suit your needs.

The CTX670 basic processor can be configured for smaller systems as a one or two cabinet system with a capacity of up to 192 CO lines and stations combined. It can expand to support up to seven cabinets with a capacity of up to 672 CO lines and stations combined (see Figure 3).

System line and station capacity is expanded by adding processor expansion Printed Circuit Boards (PCBs), cabinets and line/station PCBs.

The CTX670 easily connects to outside public and private telephone lines. All of the telephones (stations) tied to the system can have direct access to each other as well as to the public and private network.

The Base Cabinet and optional Expansion Cabinets are the building blocks of the system. Each system has a Base Cabinet, and can have from one to six Expansion Cabinets. All lines, stations, and options are tied together through the cabinets.

The overall weight and dimensions of the CTX670 cabinets are shown in Table 2.

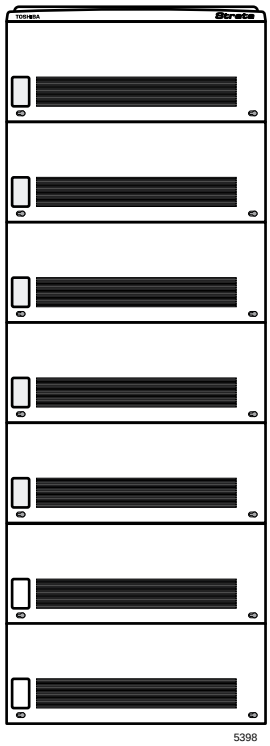


Figure 3 CTX 670 Base/ Expansion Cabinets

Table 2 CTX670 Cabinet Specifications

Cabinet	Weight	Height	Width	Depth
Base Cabinet (CHSUB672)	31 lbs.	11.625 in.	26.5 in.	10.3 in.
Expansion Cabinet (CHSUE672)	29 lbs.	9.75 in.	26.5 in.	10.3 in.

CTX670 Processor PCBs

The system operates with one set of processor PCBs (BECU/BBCU) that install in dedicated slots of the Base Cabinet. The BECU/BBCU processor incorporates the following on-board hardware features:

CPU/Memory

The CTX670 uses a high-speed, 32-bit, Reduced Instruction Set Computing (RISC) processor, Dynamic Random Access Memory (DRAM) working memory, Static Random Access Memory (SRAM) with lithium battery for back-up memory, and flash program memory.

Large-scale Integrated (LSI) circuits

The processor has LSI circuits that support the following:

- 16 built-in DTMF receivers; 32 available using the BEXS. For five or more DTMF receivers, appropriate licenses are required. See "CTX670 License Control" on page 7.
- 16 built-in Busy Tone (BT) detectors for Auto Busy Redial (ABR); 32 available using the BEXS
- 64 built-in conference circuits; up to 96 conference circuits are available using the BEXS. (See Table 7 on page 13 for more information).
- Built-in, adjustable, digital volume PAD technology enables audio volume to be adjusted in eight steps to compensate for conference and/or CO line network losses.

Memory Protection Battery

If commercial AC power is lost or if a system is moved or stored without power, the processor has an internal battery that protects data and the customer's programmed configuration from memory loss. This information will be maintained in a powerless system for at least six years.

Music-on-hold/Background Music Interface

An RCA jack and volume control are built into the processor to interface with a Music-on-hold and/ or Background Music source. With the CTX670, you can have up to 15 MOH/BGM sources by adding:

- Up to two BIOU PCBs, each provides three MOH/BGM input sources
- An RSTU PCB that provides up to eight MOH/BGM input sources

SmartMedia Memory

The processor has an on-board SmartMedia card slot. A SmartMedia flash memory card can be inserted to backup and restore customer program data. It also makes it easy to upload operating system data for software upgrades and is used for maintenance functions (see "System Fault Finding and Diagnostics" on page 66 for more details).

Network Interface

The processor has an on-board Ethernet 10Base-T Ethernet circuit for connection to Open Architecture Computer Telephony Interface (CTI) applications. This provides extensive call control and telephone support for CTI applications. The Ethernet Network Interface Card (NIC) port also enables connection to the following:

- CTX Attendant Console
- ACD server
- Local and Remote CTX WinAdmin PC
- Soft Key Control of Voice Mail features

Maintenance Modem

A built-in maintenance modem (33.6Kbps/V.34) on the processor can provide point-to-point local or remote connection to the CTX WinAdmin administration software.

CTX670 Processor PCB Subassemblies

Subassemblies can be added to the processor PCBs to enable system expansion and provide additional features. The subassemblies are:

- BEXS and BBMS expansion PCBs mount onto the processor PCBs to provide increased port capacity, from Basic (192 ports) to Expanded (672 ports). The BEXS provides switching capacity, and the BBMS provides memory capacity. For Basic and Expanded capacities of stations, lines and features, see Tables 3~7. To expand the system, both subassemblies must be installed.
- BSIS interface PCB which attaches to the BECU to provide up to four RS-232 interface ports for SMDR Call Accounting and SMDI or Toshiba Proprietary Voice Mail interface.

See Table 3 on page 11 for the number of cabinets and universal PCB slots for the Basic and Expanded systems.

CTX670 License Control

The system size and feature capability is controlled using a software License Key Code. This key code is obtained from the Toshiba Internet FYI site during the ordering process and is installed onto the system processor via Strata CTX WinAdmin. Processor license codes activate system hardware capacities in the following increments.

- The first 64 line/station ports do not require a license. Each additional set of four line/station ports requires one LIC670-4 PORTS license (maximum of 672 ports).
- The on-board DTMF receiver circuit provides up to 32 DTMF receiver hardware circuits. The first four DTMF circuits do not require a license. Each additional set of four DTMF receiver circuits requires one LIC670-4 DTMF license (max. total of 32 DTMF circuits).

Note DTMF tone receiver circuits are required for standard telephones, Voice Mail DTMF integration, Tie, DID and DNIS line service.

- The optional RS-232 serial port interface (BSIS) provides two circuits to interface with Voice Mail, SMDI or Toshiba Proprietary Voice Mail integration, Call Accounting SMDR, and two for future applications. The first circuit does not require a license, but circuits two through four each require one LIC670-SER PORT license.

Licensed Software Options

Some software options are activated with license codes. The following software options require a license:

- Each CTX system (node) in a Strata Net QSIG Network requires one LIC670-QSIG NET license. A maximum of four serial network nodes are allowed in any one serial chain in the network topology.
- Each individual CTI Open Architecture application requires one LIC670-CSTA AP license (maximum nine).

CTX670 Cabinet Slots

Base Cabinet

The Base Cabinet has two dedicated slots used for the system processor PCBs and eight universal slots, labeled "S101~S108," that can accommodate station, CO line or option PCBs (see Figure 4). It also houses a power supply.

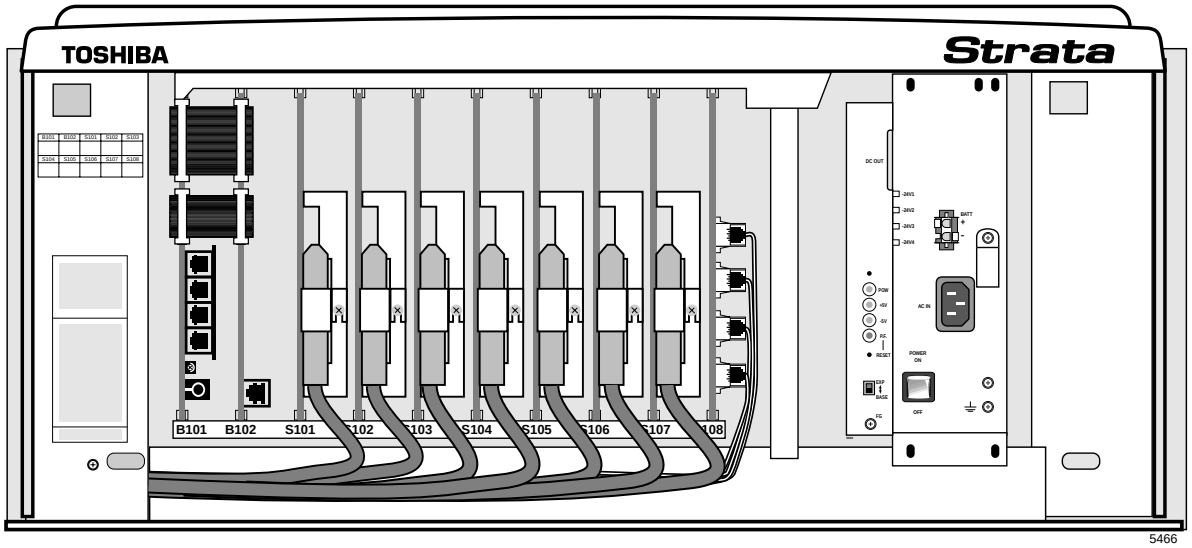


Figure 4 Base Cabinet Interior

Expansion Cabinets

One to six Expansion Cabinets can be added to increase the system station and CO line capacity. Each expansion cabinet provides 10 slots (S_01~S_10). Figure 5 shows an Expansion Cabinet.

Refer to the following section for cabinet slot and station/line capacities. Tables 4 and 5 show the number of stations and CO lines allowed when additional cabinets and PCBs are used.

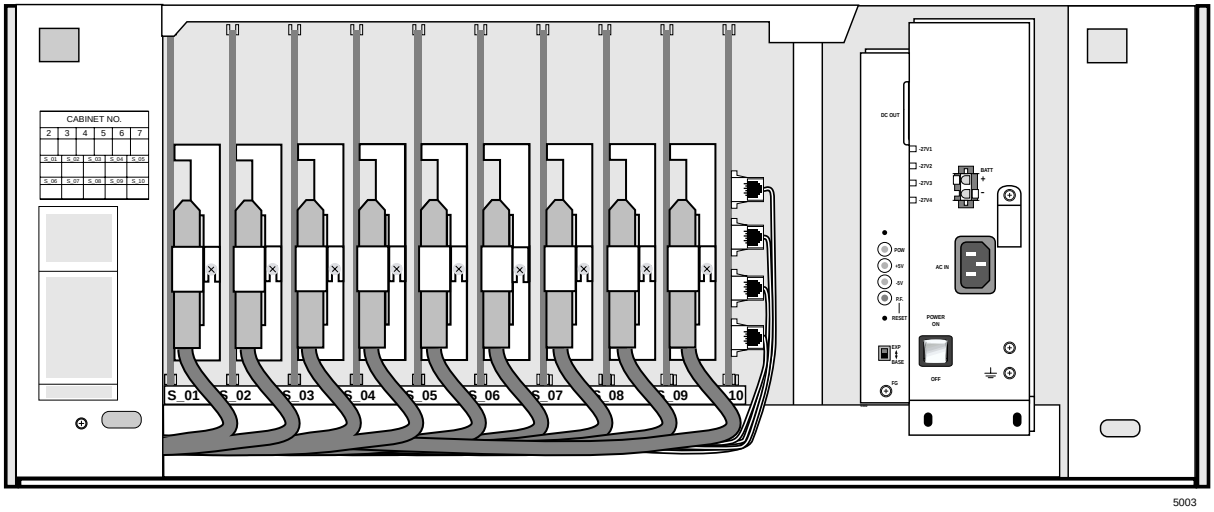


Figure 5 Expansion Cabinet Interior

CTX670 Remote Expansion Cabinet

A CTX670 Expansion Cabinet can be located up to three kilometers (1.86 miles) from its Base Cabinet. Remote Expansion Cabinets are enabled by the RRCU PCB. One RRCU connects to up to two ribbon-type Data Cables and applies the inter-cabinet signal to a multi-mode fiber-optic pair. One fiber pair can support one or two expansion cabinets in one remote location using one RRCU in the Base Cabinet and another in the Remote Expansion Cabinet.

The CTX670 Base Cabinet supports up to six Remote Expansion Cabinets (at least one RRCU PCB is required for each remote location).

Remote cabinets support the BIOU for external Page Zones, Night Bell, etc., and all CO line and trunk interface PCBs. Network clock synchronization can only be derived from digital trunks installed in the Base Cabinet (Master) location.

Capacities 3

This chapter contains Strata CTX100 and CTX670 capacities for stations and peripherals, CO lines, station buttons and system features. All tables apply to both systems unless otherwise noted.

System Capacities

Important! The maximum capacities listed for the CTX100 in Tables 3~7 are based on an expanded CTX100 (Base + Expansion cabinet).

Table 3 Cabinet and Slot Capacities

Cabinets/Slots/Ports	CTX100	CTX670 Basic Processor BBCU + BECU	CTX670 Expanded Processor BBCU + BECU + BEXS + BBMS
Cabinets	1 or 2	1 to 2	1 to 7
Universal slots	4 or 8	8 or 18	8 to 68
Maximum capacity of ports (lines + stations)	112	192	672

Table 4 Station/Peripherals System Capacities

Stations	CTX100 Base & Expansion	CTX670 Basic Processor BBCU + BECU	CTX670 Expanded Processor BBCU + BECU + BEXS + BBMS
Add-on modules (DADM3020) per Base Cabinet[1]	30 DKTs with 1 ADM 23 DKTs with 2 ADMs	55 DKTs with 1 ADM 43 DKTs with 2 ADMs	55 DKTs with 1 ADM 43 DKTs with 2 ADMs
Add-on modules (DADM3020) per Expansion Cabinet[1]	31 DKTs with 1 ADM 24 DKTs with 2 ADMs	57 DKTs with 1 ADM 45 DKTs with 2 ADMs	57 DKTs with 1 ADM 45 DKTs with 2 ADMs
CTX Attendant consoles	2	2	4
DKT3000- and 2000-series DKTs[1]	72/system (40 Base Cabinet) (40/Expan. Cab.)	152/system (72 Base Cabinet) (80/Expan. Cab.)	552/system (72 Base Cabinet) (80/Expan. Cab.)
DKT2104-CT Cordless Telephone[1]	72	160	560
DKT2004-CT Cordless Telephone[1]	72	160	560
Door locks	4	5	10
Door phone control boxes (DDCB)	2	3	8

Table 4 Station/Peripherals System Capacities *(continued)*

Stations	CTX100 Base & Expansion	CTX670 Basic Processor BBCU + BECU	CTX670 Expanded Processor BBCU + BECU + BEXS + BBMS
Door phones	6	9	24
DSS consoles (DDSS)	3	5	16
ISDN BRI station circuits TE-1 and TA (2B+D per circuit)	12	28	96
Off-premise stations	72	160	560
BPCI used for TAPI only: per cabinet[1]	35	66	66
Total Stations (Digital/Analog/ISDN BRI B channel combined)	72	160	560
Standard stations	64	160	560
Calls existing at the same time	56	96	366

1. Limit is based on cabinet Power Factor (PF).

Table 5 Line Capacities and Universal PCB Slots

Lines	CTX100 Base & Expansion	CTX670 Basic Processor BBCU + BECU	CTX670 Expanded Processor BBCU + BECU + BEXS + BBMS
CO lines – loop start (analog - 8 lines/slot)	64	96	264
CO lines – ground start (analog - 4 lines/slot)	32	72	264
DID lines (analog - 4 lines/slot)	32	72	264
Tie lines (analog - 4 lines/slot)	32	72	264
VoIP lines (4 lines/slot)[1]	8	20	20
T1 lines (DS-1)[2]	64	96	264
ISDN BRI B channel lines[3]	64	96	256
ISDN PRI B channel lines[4]	48	96	264
Total lines (Analog, T1, ISDN BRI and PRI B channels combined)	64	96	264
Channel Groups	32	48	128
Number of groups with Group CO Line buttons	32	50	128

1. Capacity is limited by FCC, Part 15, ElectroMagnetic Compatibility (EMC) restrictions.
2. T1 lines can be loop start, ground start, Tie or DID (maximum 24 lines per unit, any type or combination).
3. BRI lines provide CO line services, including Caller ID, DID and Direct Inward Lines (DIL).
4. PRI lines provide CO line services, including QSIG Networking, Calling Party Number/Name, DID, Tie, POTS, FX and DIT.

Table 6 Station Buttons

Station Buttons per System	CTX100 Base & Expansion	CTX670 Basic Processor BBCU + BECU	CTX670 Expanded Processor BBCU + BECU + BEXS + BBMS
Call Forward, Personal CF Buttons	72	160	560
CO Line Buttons	64	96	264
Group CO Line Buttons	64	96	264
Pooled CO Line Buttons	32	50	128
CO Group and Pooled Line Buttons	64	96	264
Station Loop Buttons	8	15	50
Door Unlock Buttons	4	8	16
Flexible Telephone Buttons	1600	3500	12000
Line Buttons in use at the same time	1440	3200	3200
Message Waiting Registration (DNs with MW)	130	230	800
Multiple Appearances of DNs on Telephones	2000	4000	12000
Night Transfer Buttons	2	4	8
One Touch Buttons	800	1750	6000
Primary Directory Numbers [PDNs] per system	72	160	560
Phantom Directory Numbers [PhDNs] per system	288	640	2240
[PhDNs] with Message Waiting Indication LED	18	38	128
ISDN DNs	96 (8 DNs/station)	224 (8 DNs/station)	768 (8 DNs/station)

Table 7 System Feature Capacities

Features	CTX100 Base & Expansion	CTX670 Basic Processor BBCU + BECU	CTX670 Expanded Processor BBCU + BECU + BEXS + BBMS
Pilot DNs	100	200	256
Advisory LCD Messages (Set on a Telephone)	1	1	1
Advisory LCD Messages Lists (per System)	10	10	10
Attendant Groups	1	1	1
Call Accounting SMDR Interface[1]	1	1	1
Call Forward, System CF Patterns	4	10	32
Call Park Orbits (General)	14	32	64
Call Park Orbits (Individual)	56	96	336
Caller ID/ANI/CNIS Numbers stored (Call History records)	Up to 100/ station	Up to 100/station	Up to 100/station
	Up to 660/ system	Up to 1000/system	Up to 2000/system
CO Line Groups - Incoming Line Groups (ILG)	32	50	128
CO Line Groups - Outgoing Line Groups (OLG)	32	50	128
Outgoing Line Groups (OLG) Members per system (Trunks + ISDN Line Service Index)	96	144	392

Table 7 System Feature Capacities *(continued)*

Features	CTX100 Base & Expansion	CTX670 Basic Processor BBCU + BECU	CTX670 Expanded Processor BBCU + BECU + BEXS + BBMS
Conference Circuits	64	64	96
Conferencing (three-parties simultaneously)[2]	20	21	21
Conferencing (eight-parties simultaneously)[2]	8	8	12
Conference Party types (up to 8 total lines + stations)	6 lines max. 8 stations max.	6 lines max. 8 stations max.	6 lines max. 8 stations max.
Two-CO Line Conferencing – simultaneously[2] (Two party only, no telephone or VM port)	32	48	132
Conference/Line Volume Adjustment (PAD) Groups	6	10	32
DID Numbers for Calling Number Identification/system	225	500	1000
DNIS/DID Network Routing Numbers	200	400	1000
DNIS/DID Numbers	450	1000	2000
DTMF Receivers[3]	16	16	32
E911 Groups	8	8	8
Emergency Call Groups	8	8	8
Hunt Groups (Serial/Circular/Distributed combined)	90	200	640
Hunt Group Size (DNs per group)	72	160	560
Hunt Group Stations (per system)	360	800	2800
ISDN DNs	96	224	768
ISDN Line Service Indexes	32	48	128
Night Bell Control Relay[4]	1	1	1
Night Transfer Control Relay[4]	1	1	1
Off-hook Call Announce Handsets (simultaneous)	20	21	31
Off-hook Call Announce to Telephone Speakers [5]	72	112	352
Page Mute External BGM Control Relay[4]	1	1	1
Page Zone Relays[4]	8	8	8
Page Groups (Telephones with or without External Zones)	4	8	16
Paging – (Group Paging – simultaneous stations paged)	72	120	120
Pickup Groups	5	10	32
Ring Tones (External Call Ring Tones for digital phones)	4	4	4
Ring Tones (Internal Call Ring Tones for digital phones)	1	1	1
Speed Dial - Station SD numbers per system[6]	1080	2400	5600
Speed Dial - System SD numbers per system	800	800	800
Stratagy DK Voice Mail Systems per system	1	1	1
Tenants	1	1	1
Destination Restriction Level (DRL) Classes	16	16	16
Verified Account Codes	135	300	1000
Voice Mail SMDI Interface[1]	1	1	1

1. SMDI and SMDR require BSIS serial port interface.
2. Conference circuits are used dynamically, so the maximum number of simultaneous conferences is affected by the number of conference members in each conference. The total number of members in simultaneous conferences cannot exceed the total number of conference circuits. Each conference can have up to eight members.
3. DTMF receivers are required for standard touch tone telephones, voice mail integration, Tie, DID and DISA lines.
4. An option BIOU is required for up to four zone page relays and four control relays on the CTX100 and CTX670. One control relay is provided on board the CTX100 processor.
5. Speaker OCA capacity is determined by 2B channel slot availability and power supply. Requires BVSU option in telephone.
6. Up to 100 Station SD numbers, allocated in increments of 10, can be programmed per station.

CTX100 Maximum Capacity Configuration Examples

Table 8 CTX100 Base Cabinet with Digital Telephones and Loop Start Line With or Without Caller ID

4 Universal Slots 40 Stations (Max.) 24 CO lines (Max.) 44 Stations + Analog loop start lines combined (Max.)	
Stations	**Analog loop start lines**
40	4 (none can have Caller ID)
32	8 (all can have Caller ID)
32	16 (none can have Caller ID)
16	16 (8 can have Caller ID)
24[1]	8 (none can have Caller ID)

1. Using ADKU.

Table 9 CTX100 Base and Expansion Cabinet with Analog Loop Start Lines

8 Universal Slots 72 Stations (Max.) 56 CO lines (Max.) 92 Stations + Analog Loop Start Lines combined (Max.)	
Stations	**Analog loop start lines**
72	20 (none can have Caller ID)
72	16 (8 can have Caller ID)
64	32 (none can have Caller ID)
64	24 (8 can have Caller ID)
64	16 (all can have Caller ID)
48	40 (none with Caller ID)
48	32 (8 can have Caller ID)
48	24 (16 can have Caller ID)
32	48 (none can have Caller ID)
32	40 (8 can have Caller ID)
32	32(16 can have Caller ID)
32	24 (24 can have Caller ID)
16	32 (24 can have Caller ID)

Table 10 CTX100 Base Only: Digital Telephones and T1 and/or PRI lines

4 Universal Slots 40 Stations (Max.) 48 lines (Max.) 64 Stations + T1 and/or PRI lines combined (Max.)	
Stations	**T1 and/or PRI lines**
40	24/23
32	40/40
16	48/46

Table 11 CTX100 Base and Expansion Digital Telephones and with T1 and/or PRI lines

8 Universal Slots 72 Stations (Max.) 64 lines (Max.) 112 Stations + T1 and/or PRI lines combined (Max.)	
Stations	**T1 and/or PRI lines[1]**
72	40/40
64	48/48
56	56/48
48	64/48

1. PRI lines are limited to 48B channels.

Table 12 CTX100 Base Cabinet Only with Analog Tie, DID and /or Ground Start Lines

4 Universal Slots 40 Stations (Max.) 16 CO lines (Max.) 40 Stations + Analog Tie, DID, Ground Start Lines combined (Max.)	
Stations	**Analog Tie, DID, and/or Ground Start Lines**
40	4 line (Ground Start only)
32	8 lines (4 Tie/DID max.).
24	8 line any type
16	12 line any type
0	16 line any type

Table 13 CTX100 Base and Expansion Cabinet with Analog Tie, DID and/or Ground Start Lines

8 Universal Slots 72 Stations (Max.) 32 CO lines (Max.) 80 Stations + Analog Tie, DID and/or ground start Lines combined (Max.)	
Stations	**Analog Tie, DID, and/or Ground Start Lines**
72	12 lines (4 Tie/DID max.)
64	16 lines (8 Tie/DID max.)
56	16 lines (12 Tie/DID max.)
48	16 lines any type
48	20 lines (16 Tie/DID max.)
32	24 lines any type
16	28 lines any type

Universal Slot PCBs 4

Universal Printed Circuit Boards (PCBs) installed in the Strata CTX100 or CTX670 cabinets provide interfaces for stations, lines, and peripherals. Each PCB measures 7.5 x 5.5 inches (190 x 140 mm) and mounts in the slot with a 44-pin backplane connector. PCB external connections to station equipment are made to the Main Distribution Frame (MDF) using industry-standard connectors.

Station, Line and Option PCBs

The PCBs are categorized as station, CO line or option PCBs (see Tables 14~16). Feature subassemblies that plug onto a universal slot PCB, such as the Standard Telephone Interface Subassembly (RSTS), are listed below the associated PCB. For further details, refer to the *Strata CTX I&M Manual*.

Table 14 Station PCBs

Digital Telephone Interface Unit (ADKU) (CTX100 only)	
Provides eight circuits for 3000 and/or 2000-series digital telephones.	**Interface Options:** Provides the same interface options as the BDKU (see below), but does not support BDKS. Compatible only with CTX100.
Digital Telephone Interface Unit (BDKU)	
Provides eight circuits for 3000 and/or 2000-series digital telephones (BDKU) + eight more with BDKS (optional).	**Interface Options:** Digital telephones (with or without BHEU, BPCI, BVSU, DADMs, or digital cordless telephone). Supports BDKS. Stand-alone digital cordless telephone DDSS console BATI DDCB Supports large LCD (DKT3014) features.
Digital Telephone Interface Subassembly (BDKS) Provides eight additional circuits for 3000 and/or 2000-series digital telephones. Attaches to BDKU. One per BDKU. Do not use BDKS for Speaker OCA telephones, except in slot 103 of the CTX100.	**Interface Options:** Same as BDKU. Not compatible with ADKU or PDKU.

Table 14 Station PCBs *(continued)*

Digital Telephone Interface Unit (PDKU2)	
Provides eight digital telephone circuits (2000-series phones only. Do not use the PDKU for 3000-series digital telephones.). LCD display is only 16 characters wide and the **Spdial** button will not work.	**Interface Options:** Digital telephones (with or without BHEU or HHEU, DVSU, DADMs, or digital cordless telephone) Stand-alone digital cordless telephone DDSS console DDCB Does not support DKT3014-SDL features.
Internet Protocol (IP) Interface Unit (BVPU)	
Provides four VoIP Circuits as E&M Tie lines One 10Base-T port One RS-232 maintenance port H.323 standard for Voice over Internet Protocol (VoIP).	**Interface Options:** LAN, Internet, WAN.
Digital/Standard Telephone Interface Unit (RDSU)	
Without RSTS, provides: Two standard telephone/ Four digital telephone circuits (2000-series phones only). With RSTS, provides: Four standard telephone/ Four digital telephone circuits (2000-series phones only).	**Interface Options:** Digital – same as PDKU. Standard – same as RSTU (standard Message Waiting not available)
Standard Telephone Interface Unit (RSTU3)	
Provides eight standard telephone circuits. Stutter dial tone is provided for Message Waiting audible indication.	**Interface Options:** Standard telephones Voice mail ports Off-premises stations Other similar devices Alternate BGM source Auto Attendant digital announcer Message Waiting lamp Fax machines ACD Announcer
Standard Telephone Subassembly (RSTS) Attaches to RDSU. Provides two additional standard telephone circuits. One maximum per RDSU.	**Interface Options:** Same as RSTU, except no Message Waiting lamp.
-48 Volt Supply Internal Option (R48S)	
Attaches to RSTU and RDSU 48VDC circuit for up to eight standard telephone circuits.	**Interface Options:** Optionally interfaces to the RSTU and RDSU to extend loop length of standard telephones from 600 ohms to 1200 ohms. Required for OPS operation.
Stratagy DK	
Provides two, four, six, or eight VM ports. All of the above Stratagy DK systems use eight station ports of Strata CTX capacity.	

Table 15 CO Line PCBs

Caller ID Interface Unit (RCIU2)	
Provides four Caller ID circuits. With RCIS: eight circuits.	**Interface Options:** Provides Caller ID LCD display for analog loop or ground start lines with Caller ID. Requires: RCOU, RCOS, RGLU2 or PCOU. Not compatible with T1.
Caller ID Interface Subassembly (RCIS) Attaches to the RCIU2.	Same as RCIU2.
Direct Inward Dialing Interface Unit (RDDU)	
Provides four DID circuits.	**Interface Options:** DID analog lines.
Enhanced 911 CAMA Trunk Interface Unit (RMCU/RCMS)	
E911 CAMA circuits. Provides up to four CAMA trunk circuits. The RMCU/RCMS eliminates the need for connection of adjunct terminal adapter equipment to E911 CAMA trunks. Requires one or two RCMS PCBs for two or four CAMA lines respectively.	E911 analog CAMA trunks.
CAMA Trunk Subassembly (RCMS) RCMS attaches to RMCU. Provides two E911 CAMA circuits. Up to two RCMSs per RMCU for four CAMA lines max. (One RCMS comes packaged with the RMCU.)	Same as RMCU.
Ground/Loop Start Interface CO Line Interface Unit (RGLU2)	
Provides four ground or loop start line circuits. Each can be individually set for ground or loop start operation.	**Interface Options:** Analog loop or ground start analog lines.
ISDN S/T-type Basic Rate Interface Unit (RBSU)	
Two ISDN BRI S/T point circuits (NT or TE). Each circuit is 2B+1D. (Host for the RBSS.)	**Interface Options:** Network and/or station side.
Basic Rate Interface Subassembly (RBSS) Attaches to attaches to RBSU. One RBSS subassembly per RBSU. Two ISDN BRI, S point circuits (2B+D each).	**Interface Options:** Station side only.
ISDN U-type Basic Rate Interface Unit (RBUU)	
Provides two ISDN BRI, U point circuits (2B+D each). Host for the RBUS.	**Interface Options:** Network and/or station side. Network side requires a dealer-supplied NT1 interface.
Basic Rate Interface Subassembly (RBUS) Attaches to attaches to RBUU. One RBUS subassembly per RBUU. Two ISDN BRI, U point circuits (2B+D each) subassembly for the RBUU.	**Interface Options:** Network and/or station side.

Table 15 CO Line PCBs *(continued)*

ISDN Primary Rate Interface Unit (RPTU2)	
Provides (1~8B + D), (1~16B + D), or (1~23B + D) channels (lines), depends on system programming. RPTU2 is required for QSIG Networking.	**Interface Options:** ISDN PRI POTS FX Tie (senderized) Tie (cut through) OUTWATS (intra-LATA) OUTWATS (inter-LATA) InWATS QSIG
Loop Start CO Line Interface Unit (RCOU)	
Provides four CO analog loop start line circuits. With RCOS, provides eight CO analog loop start line circuits.	**Interface Options:** CO analog loop start lines
Loop Start CO Line Interface Subassembly (RCOS) Provides four additional Loop Start CO lines. One RCOS subassembly per RCOU.	Same as RCOU.
T1/DS-1 Interface Unit (RDTU2)	
Provides T1 (DS1) Interface: 1~8, 1~16, or 1~24 channels (lines), depends on system programming.	**Interface Options:** T1 Loop start lines Ground start lines Tie lines (wink or immediate) DID/DOD lines (wink or immediate)
Remote Expansion Cabinet Unit (RRCU)	
Supports two CTX670 remote cabinets. 62.5 mμ, multi-mode fiber.	Remote cabinet not supported by main system reserve power.
Tie Line Unit (REMU2)	
Provides four analog Tie line circuits.	**Interface Options:** E&M Tie lines Two- or four-wire transmission Type I signaling Type II signaling Immediate start Wink start

Table 16 Option PCBs

Option Interface Unit (BIOU)	**Interface Options:** Provides Paging output (600 ohm and three-watt amp), four zone paging relays, three MOH interfaces and four control relays (Night Transfer and BGM mute).

Functional Block Diagrams

The Functional Block Diagrams show the PCBs and interface connectors used for connecting the stations and peripherals (see Figures 6~9).

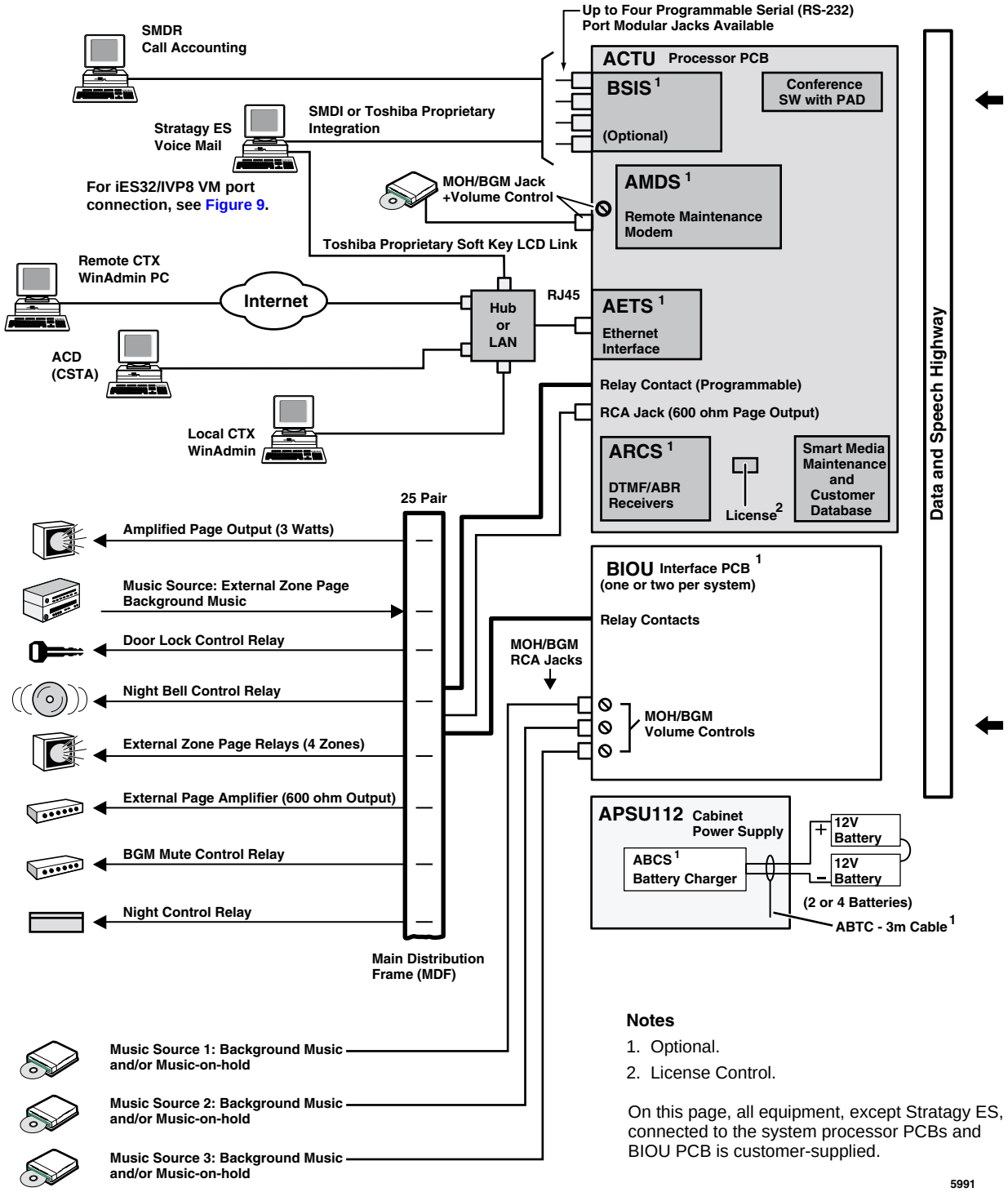
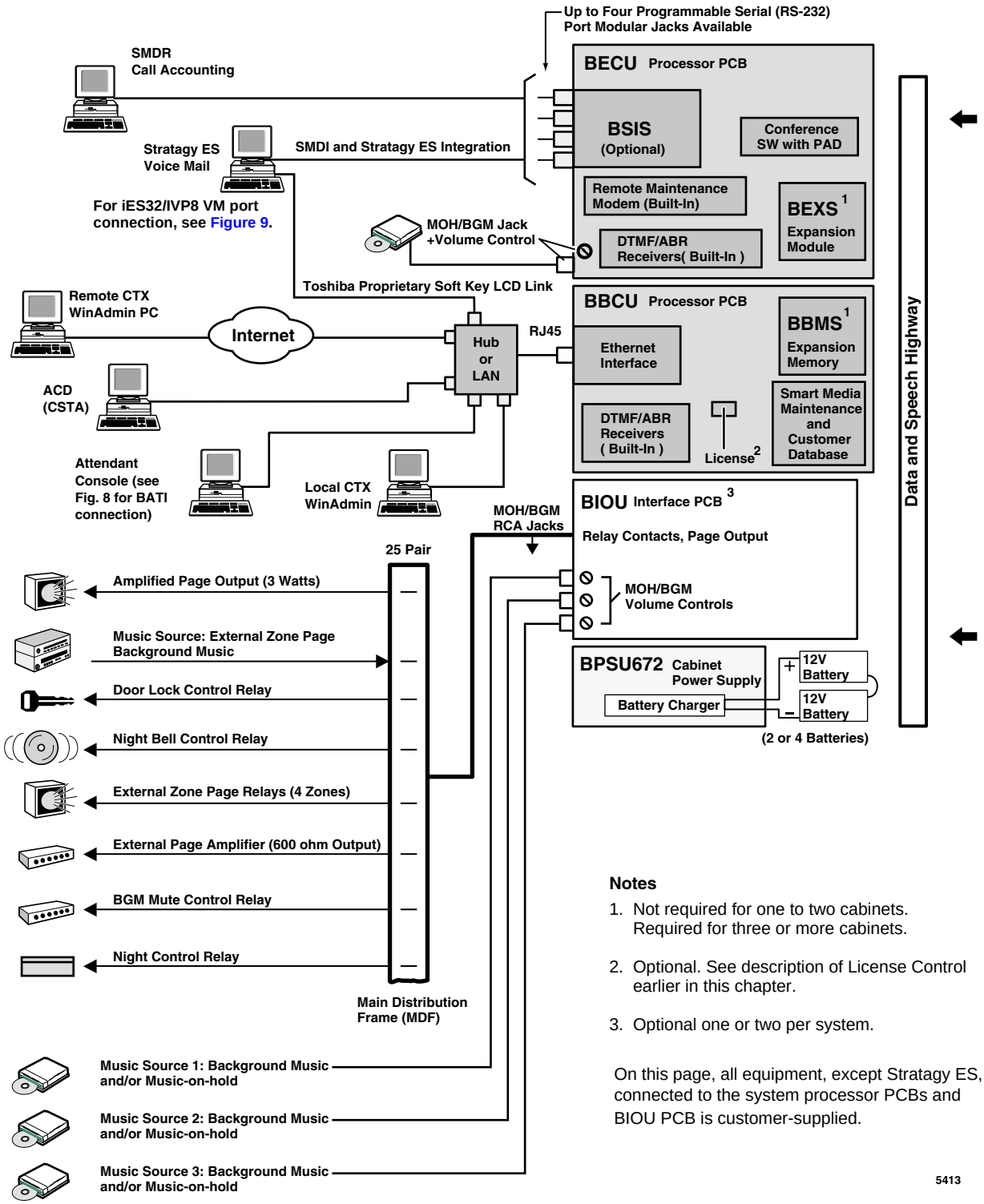


Figure 6 CTX100 System Processor and Option Interface PCBs

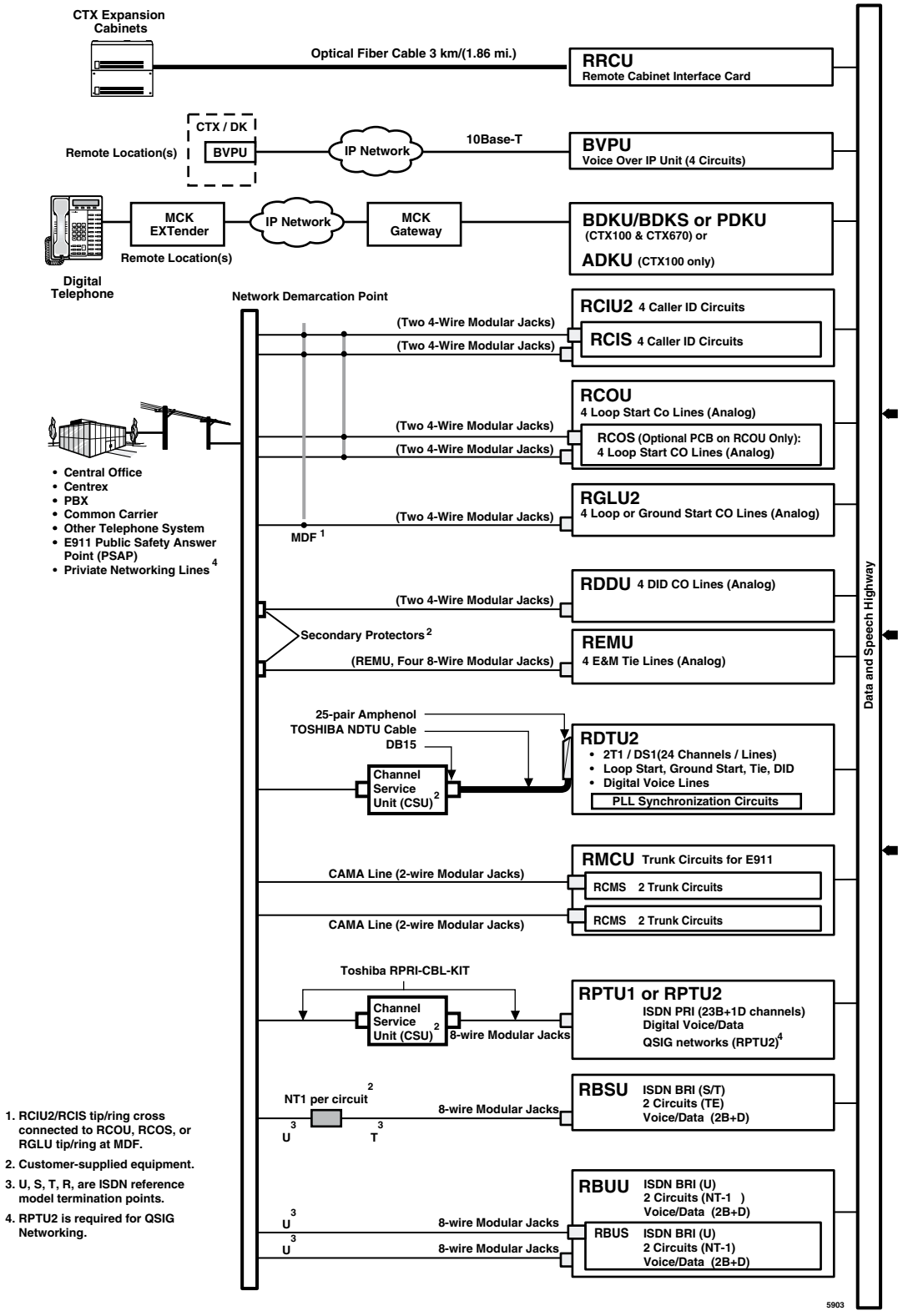


Notes

1. Not required for one to two cabinets. Required for three or more cabinets.
2. Optional. See description of License Control earlier in this chapter.
3. Optional one or two per system.

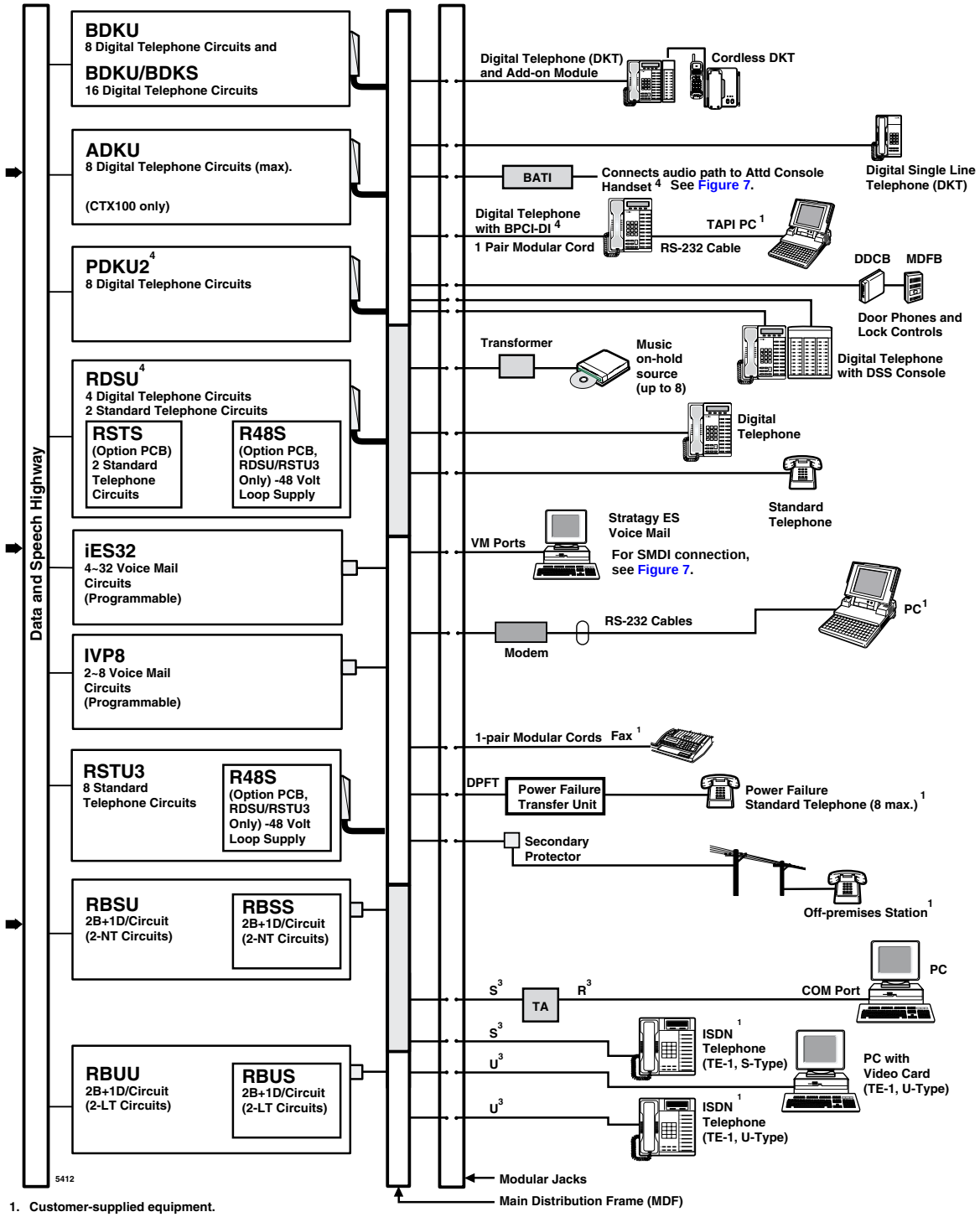
On this page, all equipment, except Stratagy ES, connected to the system processor PCBs and BIOU PCB is customer-supplied.

Figure 7 CTX670 System Processor and Optional Interface PCBs



1. RCIU2/RCIS tip/ring cross connected to RCOU, RCOS, or RGLU tip/ring at MDF.
2. Customer-supplied equipment.
3. U, S, T, R, are ISDN reference model termination points.
4. RPTU2 is required for QSIG Networking.

Figure 8 CTX100 and CTX670 CO Line Side Functional Block Diagram



1. Customer-supplied equipment.
2. RSTU2 or above is required for standard telephone message waiting lamp.
3. U, S, T, R are ISDN reference model termination points.
4. PDKU and RDSU should only be used for 2000-series digital telephones. They do not support all of the 3000-series digital telephone features, including LCD. The PDKU also does not support BPCI, BATI and the CTX Attendant Console.

Figure 9 CTX100 and CTX670 Station Side Functional Block Diagram

Telephones and Peripherals 5

This chapter discusses the Toshiba 3000-series digital telephones, as well as peripherals that are compatible with Strata CTX BDKU telephone interface circuit card. The 3000-series telephones come with a number of enhanced features, including:

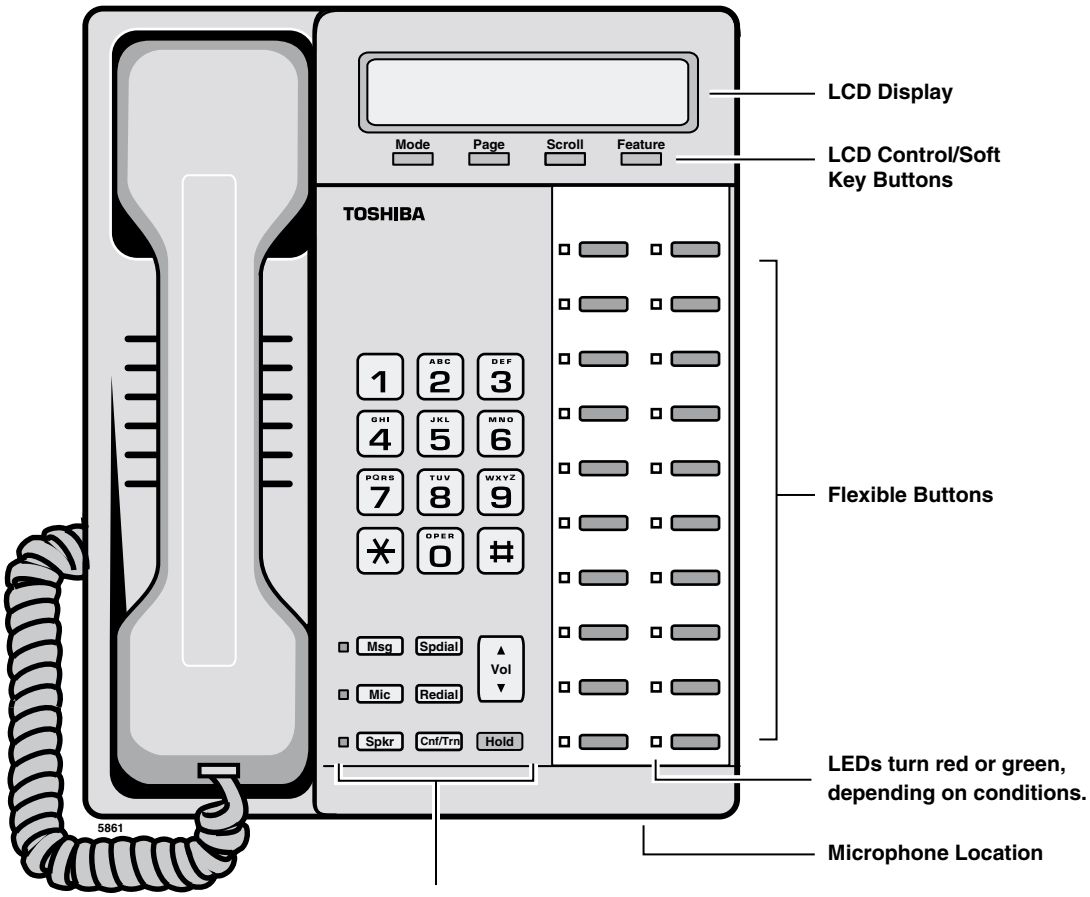
- Fixed Speed Dial (**Spdial**) button
- Four Soft Keys, located below the LCD to respond to the Strata CTX feature prompts
- Wide 24-character x two-line 10- and 20-button LCD on the two-line LCD models
- 24-character x eight-line large LCD model, which offers an adjustable tilt-screen for easy viewing. Comes with 16 Soft Keys located on the sides of the large LCD to respond to the Strata CTX feature prompts
- Additional feature adjustments, such as setting button beeps, room noise sensitivity and handset busy override tone
- Optional tilt stand to adjust the angle of the telephone on the desktop

The Strata CTX also supports the 2000- and 1000-series telephones; however, these earlier models do not support all of the features that are available to the 3000-series telephones. The Strata CTX does not support electronic telephones.

For more information on station and peripheral specifications, refer to the Appendix.

DKT3000-series Telephones

The Strata CTX supports the Toshiba 3000-series digital telephones, which offer station users a number of useful features that are easy to access (see Figure 10 and photos on the next page).



Msg	**Calls the station or voice mail device that left the message. Message LED flashes when the station has a message in Voice Mail or from another station. Also functions as a toggle switch to talk back to a handset OCA caller.**
Mic	**Turns off the microphone during speakerphone operation for private office conversations. Also used to talk back to a handset OCA caller.**
Spkr	**Turns speaker on and mutes handset microphone for group listening. Also disconnects on-hook dialing calls and is used to toggle the telephone between handset and speakerphone operation.**
Spdial	**Used to Dial Speed Dial numbers.**
Redial	**Redials last number dialed from the station.**
Cnf/Trn	**Set up Conferences or Transfers calls.**
Vol	**Controls handset, speaker, and ring volumes.**
Hold	**Places internal [DN] and outside calls on hold or Exclusive Hold.**

Figure 10 3000-Series Digital Telephone Buttons and Features

The 3000-series telephones provide a number of useful features including:

- Four or 12 Soft Keys for responding to extensive feature prompts.
- Flexible buttons – customized for each telephone to provide Directory Number, line and feature buttons.
- Hot Dialing – as soon as any dial pad button is pressed, a CO line or PDN is automatically selected to originate a call.
- Adjustable button beeps, room noise sensitivity and the ability to turn handset call waiting tone On or Off.
- The 3000-series digital telephones are available in charcoal gray or ash white. Five 3000-series models are shown below. The DKT3001 is shown on page 29.

DKT3014-SDL
14-Button Digital Large LCD Speakerphone

DKT3010-SD
10-Button Digital LCD Speakerphone

DKT3020-SD
20-Button Digital LCD Speakerphone

DKT3010-S
10-Button Digital Speakerphone

DKT3020-S
20-button Digital Speakerphone

Liquid Crystal Display (LCD) Models

The DKT3010-SD and DKT3020-SD models display up to 24 characters x two lines of information and provide four Soft Keys.

The DKT3014-SDL has 12 Soft Keys and a 24-character by eight-line LCD that can be tilted to various levels for optimum viewing. From the idle screen (see Figure 11), you can access telephone directories and speed dial lists of names or departments, internal or external to the telephone system. You can page forward or backward, or search by name or letter within a list.

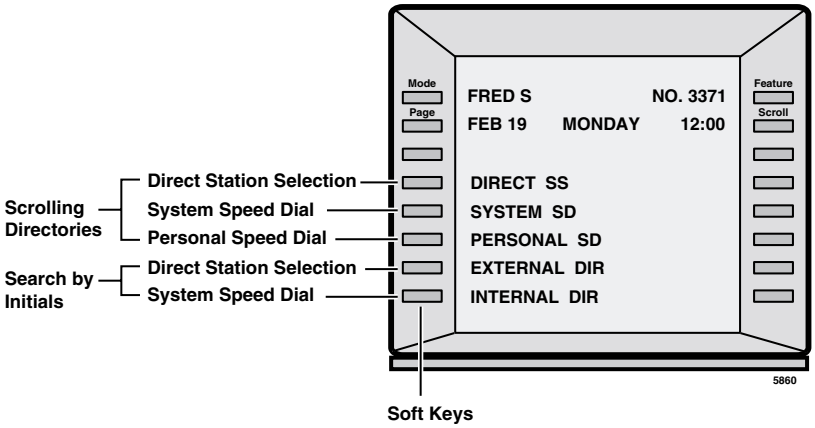


Figure 11 DKT3014-SDL LCD Screen

All LCD telephone models can provide:

- Advisory Messages
- Automatic Number Identification (ANI)
- Caller ID, Name and Number with call history
- Contrast adjustment (16 levels)
- Date/Time of Day
- Dialed Number Identification Service (DNIS Name and Number)
- Feature Prompting Soft Keys that are used as an alternative to access codes or feature buttons. Station users can access features by responding to LCD prompts.

Speakerphones

All 3000-series phones, except the DKT3001, are speakerphones which provide the following:

- **Handsfree Call Origination** – Enables users to place calls, listen and talk back without lifting the handset.
- **Handsfree Answerback** – Enables users to answer internal calls without lifting the handset.
- **Speaker OCA** – Enables users to receive a call over the telephone speaker when busy on an existing handset call.

The DKT2020-FDSP (Full-duplex speakerphone) enables handsfree speakerphone use with the option to switch between “full-duplex” (concurrent speech) and “voice switch” (alternating conversation between telephones). It also works with an optional, external, super-directional microphone (RFDM) for enhanced full duplex performance.

DKT3001

3532

The DKT3001 is a Digital Single Line Telephone. It looks similar to the other 3000-series telephone, but it has a smaller footprint. It is narrower because there are no flexible buttons and no LCD.

DKT3001 is not a speakerphone and does not have a **Mic** button, so it does not support handsfree answerback or call origination.

The DKT3001 connects to same digital station port as other 3000-series digital telephones. This makes it compatible with all Strata CTX and Strata DK systems.

Features

The DKT3001 supports many features of the other 3000-series digital telephones, including:

- On-hook dialing
- Headset/Loud Ringer Interface (BHEU)
- Line button with a red LED. The Line button for the DKT3001 is the [PDN] on this telephone.
- **Hold** button
- **Cnf/Trn** (conference/transfer) button
- **Flex** button (used for Redial or can be programmed as a Flexible button)
- **Msg** button (used for retrieving messages or can be programmed as a Flexible button)
- Message Waiting LED
- Volume Up/Volume Down button
- Handset Off-hook Call Announce (OCA)
- Most DKT features through dialed feature access codes

The DKT3001 has many additional feature advantages over standard, analog telephones:

- Automatic Line Selection
- Background Music with station control
- Off-hook Call Announce over handset
- Exclusive Hold

The DKT3001 *does not* support Handsfree Answerback, Speaker OCA, Add-on module (DADM3020) or PC Interface Unit (BPCI).

Tilt Stands

5864

Two models of desktop telephone tilt stands are available.

The BTSD telephone tilt stand attaches to the base of any 3000- or 2000-series telephone or DSS console.

The BSTA tilt stands support 3000-series digital telephones with one or two Add-on modules. Both types of tilt stands can adjust to four different angles.

DKT3000-series Upgrade Options

Toshiba 3000-series digital telephones can be upgraded with the following options.

Digital Add-on Module (DADM3020)

5843

The DADM3020 adds 20 feature buttons to DKT3000-series telephones. These flexible feature buttons can be assigned as CO line, Directory Number, DSS, One Touch Speed Dial or any other flexible feature.

Add-on modules connect directly to the digital telephones and do not require an additional interface circuit (port).

Up to two DADMs can be attached to a telephone to provide 40 buttons to supplement the telephone's 10 or 20 buttons.

The CTX supports up to 57 DADMs per cabinet (see Table 4 on page 11 for the capacities of different common control units).

Telephones with Add-on modules cannot support the Integrated PC Interface (BPCI).

Direct Station Selection (DSS) Console.

5842

The DDSS3060 consoles are for system attendants.

They operate alongside a digital telephone and have 60 flexible feature buttons. These flexible feature buttons can be assigned as CO line, Directory Number, DSS, One Touch Speed Dial or any other flexible feature.

Up to eight consoles can operate with one digital telephone; 16 consoles max. per system.

The DDSS3060 console uses LEDs to indicate call and feature status; the DDSS has dual red and green LEDs to help further define status, such as station in DND status. The DDSS3060 console connects to a digital station port on the ADKU, BDKU, BDKS or PDKU card.

Integrated PC Interface (BPCI)

An optional BPCI can be installed inside any 3000-series telephone to provide a USB connection to a PC with Microsoft® Windows® Telephony Application Programming Interface (TAPI) applications.

Information such as ANI, DNIS, and Caller ID data is sent from the digital telephone/BPCI to a computer to provide information for “pop-up” screens. The Telephone Service Provider Interface (TSPI) PC software is included with each BPCI.

The BPCI also enables simultaneous Computer Telephone Integration (CTI) and voice features, without the need of a modem or an extra outgoing line.

The PC Interface (BPCI) cannot be installed in digital phones shared with the Cordless DKT-2004-CT telephone, DKT3001 single line telephones, or telephones that have Speaker OCA Interface (BVSU) or Add-on modules.

Headset/Ringer Interface (BHEU)

The BHEU provides interfaces for both a headset and a loud ringing speaker. The optionally used amplifier in the BHEU enables users to adjust the headset volume with the volume button on their telephone.

With the loud amplified speaker feature, the speaker amplifies the ringing or voice announcement of an incoming call. The HESB speaker box is required for the loud ringing speaker and is normally mounted on a wall near the telephone.

BHEU can be installed in the same telephone that has BPCI or BVSU modules installed.

Speaker Off-hook Call Announce (BVSU)

BVSU-equipped digital telephones can receive Speaker OCA which enables stations to receive internal calls over their speaker while on another call using the handset. The BVSU is not required in a telephone to originate OCA calls or in a digital telephone that receives OCA calls through the handset or headset.

Speaker OCA Interface (BVSU) cannot be installed in DKT3001 telephones or in telephones with a PC Interface (BPCI).

Cordless Digital Telephones

Toshiba offers two cordless digital telephone models, the DKT2104-CT and the DKT2004-CT. These cordless digital telephones bring mobility and productivity to office telephones. Greater call access cuts down on leaving messages and playing "telephone tag." The compact designs of both the DKT2104-CT and the DKT2004-CT offer easy portability and mobility within the office complex.

Both the DKT2104-CT and DKT2004-CT feature digital 900 MHz technology and represent state-of-the-art design and engineering.

The DKT2104-CT and DKT2004-CT telephones operate from the same digital station port as the DKT3000-series digital telephone, which may or may not be attached. They cannot receive Group Pages or All Call Pages. They can be attached to a Toshiba DKT3000-series corded digital telephone or used as a stand-alone.

DKT2104-CT

The DKT2104-CT works with Strata CTX and Strata DK telephone systems (except Strata DK24/56/96, Release 3) and provides reliability, long life, and outstanding performance. Some of its features are:

- 900 MHz Digital Narrow Band technology
- 30 Simultaneous channels
- 32 character LCD (two line display)
- Four display operation modes, including Message Waiting (MW)
- **Hold**, **MSG** (LCD icon), **Cnf**/**Trn**, and Mute buttons
- Headset jack (headset optional)
- Five handset ring modes, including a vibration mode
- Simultaneous charging of handset and spare batteries
- Wall-mount or desktop unit with wall-mount plate, and belt clip included
- Advanced Speed Dial capabilities
- Five hours of battery talk time and 40 hours of standby at full charge

DKT2004-CT

1876

The DKT2004-CT features spread-spectrum technology providing clarity and unsurpassed range several times greater than conventional analog cordless telephones. Spread-spectrum technology offers extremely secure communications between cordless digital telephones and their corresponding base stations in most environments.

- 900 MHz Digital Spread Spectrum technology
- Nine Simultaneous Channels
- LCD provides information such as User Name, DNIS and Caller ID
- Four programmable buttons for feature or multiple line access
- **HOLD**, **MSG** (with MSG LED), **CNF/TRN**, **MUTE**, Memory Dial buttons
- Headset jack (headset optional)
- Three handset ring modes including a vibration mode
- Optional wall-mount kit available
- 20 Speed Dial number memory (in addition to 40 station speed dials)
- Three hours of battery talk time and 40 hours of standby at full charge

CTX Attendant Console

The Strata CTX Attendant Console is provided on a PC with Microsoft® Windows® 2000 operating systems. It connects to the Strata CTX processor via the LAN as a Customer Supported Telephony Application (CSTA). It also connects to a digital station port for the speech path. The console consists of the following items:

- Pre-installed CTX Attendant Console software application
- Keyboard
- Special Attendant Keyboard stickers (CTX-KL-ATCON-VA)
- Mouse

The following customer-supplied items are needed:

- Color VGA monitor (600x800 pixels) or better
- Attendant Console Interface Unit (BATI), which connects to the BDKU or PDKU station interface on the Strata CTX. Also, a handset and cradle (BATHC). A headset can be optionally ordered

  ...or

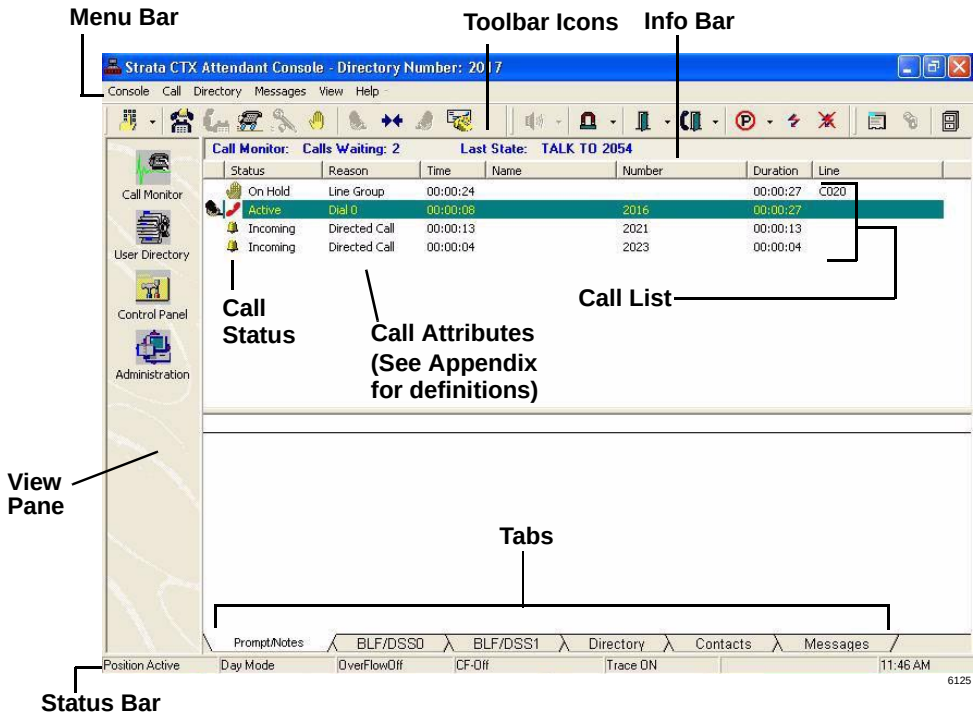
  a DKT3001 can be used as the station interface. If a headset is used, it connects to the BHEU installed in the DKT3001.

Important!

- *If a DKT telephone is connected to the CTX Attendant Console PC, the keyboard must be used for all Attendant operations when the console is running. (When the console is in Position Busy, it is still running.)*
- *When the Attendant Console software is not running, the DKT3001 telephone can be used for regular calling. Calls intended for an Attendant (Dial "0") when the software is not running will follow the Alternate Destination programmed in Strata CTX. Only calls directed to the DKT's primary extension number will ring the phone.*
- *If the handset interferes with the headset, you can unplug the handset while using the headset.*

The Strata CTX670 system supports up to four, and the CTX100 supports up to two Attendant Consoles. Multiple consoles automatically share the incoming call load on a call-by-call rotation basis. Features such as Overflow, Position Busy, and Interposition Call Transfer add to the efficiency of single or multiple console applications.

The CTX Attendant Console is designed to handle all call activity within a single Call Monitor screen, shown below. All calls will appear in a single list.


Menu Bar
Toolbar Icons
Info Bar
Strata CTX Attendant Console - Directory Number: 2017
Console Call Directory Messages View Help
Call Monitor: Calls Waiting: 2 Last State: TALK TO 2054
Status Reason Time Name Number Duration Line
On Hold Line Group 00:00:24 00:00:27 C020
Active Dial 0 00:00:08 2016 00:00:27
Incoming Directed Call 00:00:13 2021 00:00:13
Incoming Directed Call 00:00:04 2023 00:00:04
Call Monitor
User Directory
Control Panel
Administration
Call Status
Call Attributes (See Appendix for definitions)
Call List
View Pane
Tabs
Prompt/Notes BLF/DSS0 BLF/DSS1 Directory Contacts Messages
Position Active Day Mode OverFlowOff CF-Off Trace ON 11:46 AM
6125
Status Bar

Calls are marked with icons to show the current status. All calls remain on the list for the life of the call when controlled by the Attendant.

Features such as Paging, Call Pickup, Call Park offer many alternatives. The Administration window enables the Attendant to define which feature options are presented, and which option is the primary operation for that Attendant. For example, if the Attendant only needs to use an All Call Page, then this is the only option on the Tool Bar. If two zones are used for paging, as well as the All Call, then an option pull down is included on the icon. Clicking the icon starts the All Call Page, then the Attendant can select one of two page zones.

All other views available for the Attendant are for administrative and management use. They do not control any type of call handling except how chosen options affect the overall operation.

The CTX Attendant Console also enables an attendant to manage console settings, maintain a user directory, and view call statistics. The Console provides a Name/Number search that works with automatic or manual call handling. Other features include Queuing, DSS, dial pad DTMF signaling, Emergency Call ID, keyboard or mouse operation, and headset or handset operation with volume control.

Peripherals

The Strata CTX supports several types of stations and customer-supplied peripheral devices, such as door phones for visitor screening, a music source interface for MOH and ACD queues, a speaker for amplified ringer, Toshiba Voice Processing systems for voice mail/auto attendant applications, and more.

Toshiba Telecommunication Systems Division (TSD) does not provide ISDN or IP station equipment, such as ISDN IP telephones, fax machines, and computer interface devices for high speed internet access or video conferencing. Toshiba does provide the interface circuit boards that support all of the above ISDN station equipment.

MCK Office Extender and PBXgateway

The MCK Office Extender enables groups of remote workers to have cost-effective, digital line extensions off the main location's Strata CTX system and voice mail system, without the cost or administrative difficulty of installing a separate system. The Extender offers the following:

- Supports up to one, eight or 12 or 24 users per stackable unit.
- Fully-featured Toshiba digital telephones with Strata CTX system features and ACD.
- Choice of network protocol support and compression rates minimizes communications cost.
- Corporate or remote management tools provide flexible administration.
- Dual Wide Area Network (WAN) interfaces allow multiple network options like T1, Frame, Digital Data Systems (DDS), Integrated Services Digital Network (ISDN), Digital Subscriber Line (DSL), cable, etc.

Door Phone (MDFB)

Door phones can be assigned to ring telephones when the button on the door phone is pressed. The Door Phone location displays on the called telephone's LCD. When the telephone answers, a two-way talk path exists between the telephone and door phone.

Door phones can also be used as sound monitors. Station users can call the door phone (it will not ring) and listen to sounds from the surrounding area. Door phones also can operate as a "hot line." For example, a door phone can be used for calls between an office and a warehouse. Door Phones are often used with a door lock to screen building visitors. The door lock can be opened for a predetermined amount of time by pressing a button on a telephone.

1873

Door Phone/Lock Control Unit (DDCB)

The DDCB can support as many as three door phones (MDFBs) or two door phones (MDFBs) and one door lock control relay. Using the door lock control, digital station users can unlock a customer-supplied electronic door lock at the touch of a button programmed on their digital telephone or by dialing a feature access code from any type of telephone. Each DDCB requires one digital station circuit.

1874

Each door lock can be programmed to remain open between three~30 seconds. The Door Lock button LED remains On while the lock is open. LCD telephones display “DOOR UNLOCKED” until the telephone releases or times out.

External Speaker (HESB)

The HESB is a multi-functional, external, six-inch speaker unit with a built-in three-watt amplifier. It can be used as a paging speaker, an amplified talkback speaker, or a telephone’s Loud Ringer.

Toshiba Stratagy and Stratagy DK Voice Processing

The Strata CTX can operate with Toshiba Stratagy and Stratagy DK voice processing systems, which provide a number of helpful features. The Strata CTX supports in-band DTMF voice mail integration for all of the above voice mail systems and requires DTMF receivers. It also supports standard SMDI and Toshiba Proprietary voice mail integration. Refer to the appropriate Stratagy literature for details.

Cabling and Connectors

The Strata CTX uses industry standard cabling and connectors to interface with lines, stations, and peripherals. Stations use standard twisted-pair cabling to connect to the system via the MDF. Digital and standard telephones require just one pair-cabling. Two pairs may be required to achieve full distance when optional DKT subassemblies are used.

Digital telephones connected to BDKS require an external power supply to reach maximum distance from KSU when the telephone has a DADM, BPCI or BVSU.

Station PCBs connect to stations and peripherals with a 25-pair Amphenol connector via the MDF. Analog CO, DID, and Tie line circuits interface with the public telephone network via modular connectors. T1 and ISDN use industry-standard Amphenol and modular connectors (for details, see Table 26 on page 77).

Peripheral devices such as CTX WinAdmin maintenance PCs, etc., connect to a hub or LAN, which connects to the processor’s Ethernet LAN interface via an RJ45 connector and Category 5 wiring. Call Accounting and Voice Mail SMDI require RS-232 modular adapters and cords to connect to the processor BSIS interface.

Features 6

This chapter contains the Strata CTX100 and CTX670 features. They are presented in alphabetical order to make it easy to locate each feature.

Account Codes

Account Codes are often used for cost allocation of the call or the time the caller was involved on a phone call. The codes are printed on a Station Message Detail Recording (SMDR) printout along with other call details so that the customer can identify all calls associated with a specific account code.

Account codes may be forced (required after dialing all or specific phone numbers) or voluntary (optionally entered anytime during calls). Codes can be as long as 15 digits and can be verified or non-verified by the system. An account code button can be programmed on a digital telephone to make voluntary account code entry convenient and easy.

Add-on Module (DADM)

One to two DADM3020s can be attached to a DKT3000-series digital telephone to provide an additional 20 or 40 flexible buttons. DADM3020 buttons can be programmed with outside line or Directory Number buttons, Direct Station Selection, One Touch Speed Dial or any other flexible feature button.

Advisory Messages

Any telephone user can set a message on his or her telephone. Whenever another station with a display calls a station with a message set, the information in the message displays on the calling station’s LCD. This feature allows users to define their current status and make that status available to others attempting to call that person. This status is also sent to Attendant Console positions.

Alternate Answer Point

Users can answer a transferred internal or outside line call from any station that has a Directory Number button appearance of the “transferred to” Directory Number.

Automatic Busy Redial

Automatic Busy Redial (ABR) enables a digital or standard telephone user to automatically redial a busy outside number multiple times at programmed intervals. Strata CTX supports a maximum of 16 or 32 simultaneous registrations of ABR (limited by the number of busy tone detectors in the system). Each station may only have at most one call registered with ABR at any time.

Automatic Call Distribution (ACD) Server

An external ACD software option with the Strata CTX provided by connection of an external PC-based CTI application server. The CTI server will run both the ACD call processing application and the separate Management Information System (MIS) application such as Insight CTX, as well as other CTI applications.

The ACD application will be available in Basic and Enhanced feature functionality, along with the number of groups and active agent size increments to provide cost-effective pricing levels according to the user's needs. Enhanced ACD includes all basic capabilities plus multiple group login, skills-based routing, priority queuing, time scheduled ACD queues, agent and call priority escalation handling, and balanced call count agent search. For more information, refer to the *Strata ACD General Description,* or the *Strata ACD Application Software and Documentation Library* or *OAISYS* CD-ROMs.

Multiple Group Agent Login

(Enhanced Feature)

ACD agents can be logged into multiple ACD groups, enabling agents to answer calls for multiple groups. This is very useful for back up coverage between groups. It is also the foundation for skills-based routing and agent priority routing, enabling many advanced call center applications.

Skills-based Routing

(Enhanced Feature)

Based on the caller's input, the system can route the call to the agent best suited to handle the call. Calls can be routed to certain agents, based upon agent capabilities, in addition to Dialed Number Identification Service (DNIS), CO line, or Auto Attendant routing into different groups. With the capability for agents to log into multiple groups, calls can be routed to different agents based upon skills needed for each specific call.

Priority Queuing

(Enhanced Feature)

ACD calls can optionally be tagged with a priority number before they are placed into the ACD group queue. The priority number assigned to the call determines where the call is placed in queue. This feature enables high priority calls to be answered sooner than low-priority calls. The escalation parameter ensures that no call is lost by higher priority calls.

Advanced Call Routing

(Basic Feature)

The optional Call Router enables calls to be routed based upon parameters such as Caller ID, Account Numbers, private lists, time-of-day, day-of-week, day-of-year, and user entered data (account code, etc.). This is an optional feature that can be added to the ACD application.

Agent Priority Routing

(Enhanced Feature)

The Agent pool can be expanded when traffic gets heavy based upon agent priority levels. When all agents are busy at one level, calls automatically get distributed to agents at the next level. Calls can be distributed by agent priority, preferred agent treatment, or balanced call count.

Intelligent Announcements

(Basic Feature)

The holding caller can be informed of call status, such as their place in queue or estimated time before an agent answers. The intelligent announcement function can also offer alternative options to continuing to hold, such as going to voice mail.

IVR Voice Assistant Open Database Connectivity (ODBC) Access

(Basic Feature)

There are two options that can be used with customized services: Interactive Voice Response (IVR) Voice Assistant (VA) application can be used as a stand-alone product and/or as an IVR service to the ACD application. For example, an IVR port could be used to do an external page to alert agents to return and login to an ACD queue when it gets too overloaded with calls.

Other useful functions include gather and validate user input, play menus and act on response, and trigger other events. The IVR VA can also be used to provide low cost text to speech capabilities. The IVR VA is an optional feature that can be added to the ACD application.

Automatic Callback (ACB)

When a station user dials a busy station [DN] or outside line access code and receives busy tone, ACB can be activated by pressing an ACB feature Soft Key or by dialing **4**. When the busy [DN] or outside line becomes available, the station will be automatically called back and be connected to and ring the originally called station or receive dial tone from an outgoing line.

When ACB is activated, the calling station receives success tone followed by busy tone. Once ACB is activated, the caller can hang up. ACB can be canceled any time using an access code. It will also cancel automatically after a predetermined time.

Automatic Line Selection

This feature automatically connects a telephone to a specific line or extension button when the user lifts the handset off-hook, presses the **Spkr** (speaker) button, or presses a digit on the dial pad (Hot Dialing). This feature is necessary to make telephone operation consistent for the user because a telephone can have up to 20 line and extension buttons. Each telephone can be assigned in system programming with various options that determine what type of line or extension button is selected when the user takes the handset off-hook to make or answer calls.

When answering calls, this option can be set to answer the call or not when a call rings the telephone and the user takes the handset off-hook. If the option is set to not answer automatically, the user can press the ringing button on the telephone to answer manually. With Automatic line selection, if more than one type of call is ringing simultaneously on the telephone, this option selects which type of call will be answered as a priority, then the longest ringing call in that call type will be answered first.

Automatic line selection options are set independently for each telephone, for originating new calls and answering ringing calls. This feature can also be disabled on all or selected telephones to allow users to manually press a button to originate or answer calls.

Automatic Release

The system will automatically release line connections under certain conditions.

Automatic Release from Hold

When a line is on hold and the held party hangs up, the line is automatically released. Individual loop start CO lines can be programmed to detect disconnect supervision signals from the CO and to respond by releasing the line. If the CO does not provide Disconnect Supervision, the user must manually retrieve the held line and then hang up.

Automatic Release of Incoming Calls

An outside caller may be placed in a queue waiting for an external application to handle the call such as an Auto Attendant, IVR, ACD or other device. If the CO line for that call does not offer "disconnect supervision," that call may remain in a holding position until forced to release the connection.

This feature provides full use of all CO lines at all times. A CO line is not tied up if the call goes unanswered and no alternative call handling is provided. This is very useful for disconnect supervision in voice mail and built-in auto attendant applications, but availability and reliability of the signaling from the CO must be confirmed.

Station Automatic Release

When the distant party disconnects from a call, the remaining digital telephone is automatically made idle, busy tone is not sent to the speakerphone or handset, and the digital telephone is automatically released. A digital telephone is released and returned to idle state. A standard telephone is simply released and returned to standard dial tone. The programming choice for this feature is system wide.

Background Music (BGM)

Background music audio can be played through the speakers of digital telephones and external paging equipment. The Strata CTX supports up to 15 BGM audio input interfaces. Selection of which BGM source is played can be done individually by each telephone user and for each external page zone through the System Administrator's telephone.

Call Completion

When calls are not completed because the station does not answer, is busy, or is in Do Not Disturb. A series of options are available to the user when encountering these conditions. They include changing the calling signal from Voice Announce to Ringing or vice versa, setting Automatic Callback, setting the Message Waiting light, Camp on Busy, Overriding the condition with Privacy/DND/Executive Overrides, or using Off-Hook Call Announce.

These options are easily activated by dialing a single digit code or pressing a soft key when the condition is recognized. These options are individually set for each telephone to be able to activate the call completion feature and separately to permit the feature to be activated when called.

Call Forward

Call Forward diverts internal and external calls intended for a Directory Number [DN] to a destination specified for that [DN], under calling conditions specified for that [DN]. Call Forward may be activated from the station that owns the [DN] or remotely from another station or from outside the system from a DISA line. Call Forward may be applied to any [DN] ([PDN], [PhDN], or Pilot [DN]).

There are two types of Call Forward options: System Call Forward and Station Call Forward. Each type may be activated independently or simultaneously for each telephone. If Station CF is activated, it will override System Call Forward on some or all calls.

Station Call Forward

Station users can set their individual call forwarding conditions and destinations as they choose (see "Call Forward Conditions" and "Call Forward Destination" in this section). Station forwarding has priority over System Call Forwarding, if set.

Station Call Forward provides two types of Call Forward (Any Call and Incoming line calls only). One type directs any type of a call to a designated destination; the other type directs only private or DID lines to a designated destination. Both types can be set on a telephone simultaneously with each type having a unique destination.

This allows the user to forward incoming calls on private or DID lines to a different destination than internal or transferred calls. If private and DID line calls are set to forward independently to an alternate destination, then internal and transferred calls will forward to another destination per Station Call Forward (any call) or System Call Forward.

System Call Forward

A system option is available to forward unanswered calls to voice mail or some other pre-determined destination. This option is set up for each station by the System Administrator using CTX WinAdmin. This feature is applied to station users that do not have any type of Station Call Forward set on their telephone. This ensures efficient call handling and better service to callers even when station users do not have Station Call Forward set at their telephone. Call Forwarding can also be set up by department with a special mailbox or destination with the use of Phantom Directory Numbers [PhDNs].

There are 32 different System Call Forward patterns that can flexibly forward calls with unique call type, condition and destination settings. Each pattern can be set up and assigned to individual stations by a System Administrator using CTX WinAdmin. Any pattern can be applied independently to each station's [PDN] or [PhDN]. System Call Forward patterns applied to stations can be changed automatically per Day/Night CO assignments.

Although System Call Forward is set up and assigned to individual telephones by a System Administrator, each telephone user can turn the feature On/Off from their telephone using a One Touch button or access code. Station Call Forwarding always overrides System Call Forward.

Call Forward Conditions

Call Forward (CF) conditions refer to the status of the [DN] that causes a call to forward. Whether using Station or System Call Forward, the CF conditions include: Busy, No Answer, Busy-No Answer, and All Calls (station CF only). Call Forward No Answer times are set individually for each station in Station Call Forward and system wide for all System Call Forward Patterns.

Note OCA and Voice First Calls will not Call Forward-No Answer unless the caller presses **1** to switch the call to tone ringing.

Call Forward Destination

Whether using Station or System Call Forward, the CF destination can be an internal Directory Number, a Hunt or ACD Group, Voice Mail, or a public or private network telephone number.

In the last case, the forwarded call will access an outside line or line group and dial an external telephone number. Both the line access code and the telephone number are set in the Call Forward destination during the Call Forward setup operation.

Station Call Forward allows one destination per each type of Station Call Forward (Any Call or Incoming Line Calls) set on a telephone. System Call Forward allows two destinations per Call Forward pattern: the Primary Destination and an alternate, in case a call cannot forward to the Primary Destination (e.g., the Primary Destination has been unplugged or malfunctions).

Call Forward – Call Types

In each System Call Forward pattern, the Call Forward conditions and destinations can be set independently.

For Station Call Forward, the destination and condition for each station can be different for incoming CO line calls, and internal and transferred calls.

Call Forward Remote

A station's personal call forwarding destination can be cancelled or changed to another outside number or an internal voice mailbox either remotely via DISA or from another user's telephone. Changing Call Forward remotely is password protected. System Call Forward can be changed locally or remotely using CTX WinAdmin.

Call Forward Override

See "Call Forward Override" on page 60.

Call History

Incoming calls with Caller ID or ANI information may be optionally recorded into a rolling list for the station where the call is ringing. The call is placed in the list along with the number, name (if provided), time and date of the call, and status of the call (answered, abandoned, or redirected). This list is accessible by the user from the telephone LCD and any call may be selected and redialed using the flexible **Caller ID** button.

When calls ring a button (**Line** or [DN]) that appears on multiple stations, the number is stored on the telephone that is designated as the owner of the **Line** or [DN] and on the telephone that answers the call. If an incoming call is directed to a telephone, but the call is not answered by that telephone because it hunts or forwards to another destination, the call record will still be stored on that telephone as "redirected" and on the telephone that answers the call as "answered." If a call is not answered, it is stored on the line or [DN] owner's telephone as "abandoned."

To store call records, a telephone must be allocated Call History memory by the System Administrator. The number of call records allowed per station and the total number of call records per system is provided in Table 7 on page 13.

Call Park

Call Park gives any station, regardless of type, a method for holding calls. By parking a call, you are free to make other calls and retrieve the call at a later time or use the paging system to announce a call to be picked up by someone else on the system. Any call can be parked. Parking a call to your phone is known as Local Park, parking a call on someone else's phone is known as Remote Park, and if a general orbit is used, it called Auto Park.

Call Park Orbits

The Call Park feature enables a station user to place a call temporarily in an orbit so that the call can be retrieved by any user, either from the same station or from a different station. Personal Park Orbits are available to any type of telephone, including standard telephones. If a call is parked, but not retrieved within a preprogrammed time period, it will recall the parking telephone. The Park recall time is set individually for each station.

Refer to Table 7 on page 13 for the number of General Park and Personal Park Orbits, depending on the system processor.

Park and Page

This feature enables station users to park a call (in a General or Personal Park Orbit), enter a Page Zone or Group access code, and then announce the orbit number of the waiting call to the Paged party. A pre-programmed One Touch button can be assigned to telephones to automatically connect to a predesignated External Paging circuit, a Telephone Paging group or both.

Call Pickup

Call Pickup enables station users to pick up all types of ringing or held calls including internal, [PDN] or [PhDN] calls ringing or on hold at other stations. Station users can also pick up CO/DID/Tie line calls ringing or on hold at other stations, CO lines ringing during Night Mode to External Page or night bell, tandem CO line connections and Door Phone calls. Call pickup can be performed through programmable buttons (Directed Pickup, Group Pickup), or with an access code.

Call Waiting

When a station is busy with a call and another call is directed to that station's busy **Line** or [DN] button, two short beeps are issued to alert the telephone user of the pending call. To answer the Call Waiting, the user must transfer or disconnect the existing call.

Call Waiting works for calls originating from within or outside the system. The length of the Call Waiting beeps is different for internal and external Call Waiting. The different beeps distinguish which type of call is waiting.

Caller ID DNIS or ANI information appears on LCD telephones for 10 seconds. If Caller ID information is not available, the device name, such as the CO line or DNIS name or number is shown.

Digital telephones can be adjusted to receive or not receive Call Waiting tone over the handset or headset receiver, as well as the speaker. Standard telephones will receive Call Waiting tone twice from the handset receiver. Call Waiting tones can also be turned off on each station by a System Administrator.

When a station is busy with a call and another call is being received, a tone alerts the caller of a pending call. On LCD telephones, the Caller ID information displays for 10 seconds. The combined effect of the Call Waiting alert tone with the displayed information enables users to identify whether or not they want to interrupt their current call for the waiting call.

To answer the Call Waiting, the current call must be put on hold, terminated or transferred. Multiple calls can be queued to a single station, all waiting for that station to become free; the call at the head of the queue provides the Call Waiting signal and LCD indication.

This feature works with both digital and analog single-line telephones. The tone (two beeps) signaling Call Waiting tone is provided through the speaker of the digital phone. For standard analog telephones, the tone is inserted into the speech path. Caller ID display is not available with standard telephones.

Caller Identification

Caller Identification (Caller ID) is the general term for the information provided identifying the originating party of a public network call. The name and telephone number of the calling party displays on the ringing telephone's LCD. Incoming calls with Caller ID or Automatic Number Identification (ANI) information may be optionally recorded into a rolling list for individual stations. Station users with LCD displays can access this list to select and redial these calls (see Call History). Caller ID service from the carrier must be subscribed on analog CO lines or T1 ANI in order to receive calling number and name into the Strata CTX system.

Caller ID lists can include the number, name (if provided), time and date of the call, and status of the call (answered, abandoned, or redirected). Digital stations are assigned memory for creating the Call History. See Table 7 on page 13 for the number of call records per station and system.

ISDN Calling ID Name and Number

Both Caller ID name, if available from service provider, and number are supported for incoming calls using either ISDN NI-1 or NI-2 BRI or PRI lines. Caller ID names can be accepted by the Strata CTX from a CO with NI-1 or NI-2. NI-2 is the only way a 5ESS CO delivers Caller ID names on PRI and BRI. Nortel DMS CO with NI-2 installed also uses NI-2 to deliver Caller ID names. Only a Nortel DMS CO can provide Calling Names for NI-1.

Camp on Busy

Automatic Camp On

When a call comes in to a busy station from an outside line and that station does not have an idle button for the call to ring in on, and Station Hunting or Call Forward is not applied, the call automatically camps on to the busy station. This permits incoming calls to be accepted even if the station is busy. The outside caller will receive ring-back-tone immediately and the called station will receive two bursts of Call Waiting tone.

If the calling line has Caller ID, ANI, or DNIS information, it will be displayed on the called station's LCD for 10 seconds. Auto Camp On also applies to incoming line calls directed to Hunt Groups, Voice Mail systems, etc.

Various types of internal calls from one station to a busy station, voice mail system or hunt group can also Camp On automatically with system programming options. For details on these types of calls see the Camp On-Busy and Station Hunting descriptions.

Off-hook Camp On

A station caller who dials a busy station or line access code can remain off-hook to be automatically connected when the station or line becomes idle. After dialing a busy [DN] and receiving busy tone, the caller can just remain off-hook and Camp On will be initiated automatically after a predetermined time or the user can dial a **1** and remain off-hook to initiate Camp On immediately. When camp-on is activated, the caller will receive success tone followed by Ring Back Tone. The station that is the object of a camped-on call will receive two bursts of call waiting tone (see Call Waiting).

Even if Voice First is set at the called [DN], the station will be called by tone ringing when it is connected by Camp On. Internal and external stations can be the object of a Camp On. Calls may be camped on to the pilot number of Station Hunting groups and will be delivered to the first station in the group to become idle. ACD pilot numbers cannot be the object of a Camp On.

Incoming calls from outside lines to busy DNs camp-on automatically (see "Automatic Camp On," previous section). When a station dials the access code for an outside line and receives busy tone because all lines are busy, the user can remain off-hook and dial **1** to camp on to the busy line group. When a line becomes available, the station will connect to the line and receive dial tone.

When more than one party is camped on (queued) to a destination, the party with the highest Queuing Priority Level (QPL) will be connected first when the destination becomes available. If the parties have the same QPL, the longest waiting call will be connected first.

Calls will camp on to hunt groups when all members of the group are busy (see "Station Hunting" on page 64 for more details).

Cancel Button

The **Cancel** button voids the last entry or step in a procedure. This enables the station user to correct an error and then continue without having to starting over.

It is important to consider the consequences of this button in regards to the overall task. For example, during a conference call, **Cancel** will disconnect the last party added to the conference.

Centrex/PBX Compatible

All system features are compatible with Centrex/PBX operation, including repeat of Centrex/PBX ringing cadence, one-button access to Centrex/PBX features, a two- to five-digit station numbering plan, and Delayed Ringing to selected stations.

Centrex Ringing Repeat

The system can mimic CO/Centrex/PBX ringing cadences received from outside lines when it rings a called station.

Classes of Service (COS)

Classes of Service are the mechanisms for assigning features and services to lines and stations within the system. The Class of Service for a given device, such as a station, is defined using 38 parameters. There are 32 Class of Service patterns available, each pattern can be set up to allow a unique combination of features. Each station and line group can be assigned independently to one of the 32 COS patterns.

Computer Telephony Integration (CTI)

CTI combines the capabilities of the Strata CTX digital business telephone system with custom functionality provided by computer applications. This can be provided through the optional Digital Telephone Integrated PC Interface or a system connection using the LAN connection.

Digital Telephone Integrated PC Interface

For CTI applications, digital telephones interface to a PC that runs the application software using the Microsoft Telephone Application Programming Interface (TAPI), to provide customized functionality. The PC must run Microsoft Windows software.

Any TAPI-enabled PC software is compatible with Strata CTX systems. The most common types of application are database look-up and pop-up screens that provide information on the calling party. From a Strata CTX system, Caller ID, ANI, DNIS and call processing information can be passed from the digital telephone to the application computer.

The 3000-series digital telephone uses an integrated PC Interface Unit (BPCI) for TAPI and data switching simultaneous voice/data applications. The 3000-series digital telephone must be connected to the system through a BDKU digital station card. The BPCI provides a highly functional interface for fast, positive call control via a USB port and supports media streaming with TAPI 2.0 functionality.

Conference Calls

Conference calling enables other people to join your conversation. These additional people can be inside or outside the Strata CTX system. Any station can set up a conference with other stations or outside lines. A conference is defined as any time three or more parties join into one conversation. A maximum of eight parties are allowed into a conference with up to six from outside lines or standard stations. The originator of the first conference is the “master” and controls adding and deleting conference parties. The conference “master” can drop off the last added party by using the **Cancel** button.

Conference On-Hold

A conference call may be put on Hold so that all the remaining conferees remain connected and no Music-on-hold is applied. The person putting the conference on hold may rejoin the conference by pressing the **Line** button on his phone. The Hold state of the conference can be released from another station by pressing the **Line** button of that station. At this time, the station that released the Hold state becomes Conference Master. This enables one person to establish a conference call for others.

Join Button

Join allows an attendant or digital station user to connect two established calls to each other.

Releasing from Tandem CO Line Connections

This feature enables unattended line-to-line connections for the Strata CTX, freeing the conferencing analog station or voice mail port for other calls and important tasks. When a tandem connection is set up with a [DN] button, the [DN] button will go idle after releasing from the connection. The [DN] can then be used to make or receive calls from the originating digital telephone.

Standard telephones and/or VM devices can establish tandem analog CO line connections and then release from them without disconnecting the tandem connection in the Strata CTX. After releasing from a tandem call, reconnecting to the call can be accomplished by dialing an access code. This reconnect feature does not work if one or both of the CO lines are digital.

Whether or not tandem line buttons appear on a telephone, the telephone user can enter the connection and release the line that was connected to the original line or release both lines by pressing the **Cancel** button.

Voice Mail Conference

Voice Mail ports may be included in conference calls. This enables all members of the conference to listen to and play voice mail messages.

Continuous DTMF Tone

Dual-Tone Multi-Frequency (DTMF) dial signal is transmitted to the CO line or voice mail/Auto Attendant device for as long as the telephone user presses a button on the dial pad. This feature may be selected for each digital telephone. Standard telephones always provide continuous DTMF tone operation.

Credit Card Calling

Callers can make “0+” telephone credit card calls from selected toll restricted stations. When dialing from toll restricted stations, if the caller does not enter a credit card number after dialing “0,” the call will be disconnected. Calls are billed to the credit card instead of the Strata CTX CO line. The “0+” credit card calling feature can be enabled, selectively, or assigned to stations and CO lines capable of supporting this service.

CTX WinAdmin

CTX WinAdmin is the Strata CTX administration software application for programming and maintaining the system. It operates with Microsoft Windows 2000® with Windows Explorer 5.5 or higher. It has a user-friendly GUI and provides access levels for technicians and end-user administrators.

Strata CTX WinAdmin connects to the system processor’s network jack or maintenance modem (33.6Kpbs/V.34) modem. Direct wire connection, LAN connection or remote connection over the Internet or PSTN is also available.

Data Privacy

This option blocks calls to data devices that are in use. This prevents override calls and warning tones from interfering with data devices such as modems and ISDN data terminals.

Day/Night Mode – Auto Schedule

The system has three operating modes that are based on the time-of-day, day-of-the-week, and up to 128 holiday schedules. The operating modes are Day, Day2, and Night. Each mode controls the routing of incoming line calls and settings for station and line Class Of Service restrictions. The system can be programmed to use all three modes, Day/Night mode only, or just the Day mode. The system switches automatically from one mode to the next based on the system's time-of-day clock.

Example Day/Night Mode Applications:

- **Incoming Calls** – Incoming line call routing of individual DID and DNIS numbers or ground/loop start lines, change their ringing destinations automatically according to the date and the time of day.

  For example: On workdays, calls are routed to the attendant, individual telephones, ACD groups, etc., until 5:00 p.m. After 5:00 p.m., calls are routed off-primes to another office, to the Night Bell, or to night announcements and voice mail message boxes. On holidays and weekends, calls are routed independently to the appropriate holiday announcements or voice mail message boxes.

- **Class Of Service** – Station, lines, and DID numbers are assigned 38 options in Class of Service. These include Toll Restriction, Override privileges, allowed tandem connection, security code administration, etc. Any of these options can be changed independently for each telephone, line and DID number when the system switches from one operating mode to another.

  For example: When the system changes from the Day to Night mode, selected stations can be automatically restricted from dialing outside or long distance calls. Note that outgoing route selections set in LCR are switched using a route selection schedule that is independent of the Day/Night mode schedule.

- **System Call Forward** – The System Call Forward settings for stations can be changed automatically when the system changes from the Day to Night mode. For example: During the day, a telephone can forward to a person's car or cell phone, and at night automatically forward to the person's voice mailbox.

The system also enables users to manually change the Day/Night operating mode, even if the system is using the Auto Schedule feature. A **Night Transfer** button can be set on telephones for manually switching at any time from one mode to another. The button's LED flash rate indicates the system's operating mode.

If used with the System Auto Schedule operation, the **Night Transfer** button overrides the current Auto Schedule mode. However, when it is time for the system to switch to another mode per the Auto Schedule timer, the system will switch to the mode set by the Auto Schedule.

Example: If the system is switched from Day to Night at 2 p.m. manually with the Night Transfer button (Auto Schedule is set to switch from Day to Night at 6 p.m.), the system will still automatically switch back to the Day mode at 8 a.m. the next morning per the Auto Schedule.

Delayed Ringing

If an incoming CO, DID or Tie line or internal [DN] call rings a station [DN] and is unanswered, alternate DKTs can be programmed to ring at a later time. A separate delayed ring time can be set for each CO line group. The stations that were ringing initially will continue to ring after the Delayed Ringing begins. This feature is assigned for each line or [DN] button independently for each DKT.

Destination (Toll) Restriction

Strata CTX offers Destination Restriction as a major expansion of traditional Toll Restriction. Historically, Toll Restriction was used to prevent the unauthorized use of toll prefixes to the PSTN: long distance (1), operator assistance (0) or international (011).

Strata CTX has expanded this to include restriction based on any string of dialed digits. A true, international business telephone system, Strata CTX can restrict any string of up to 11 dialed digits, including * and #. Eleven-digit screening allows control of access to individual telephone numbers in remote Area Codes. Restriction of * and # controls users' access to vertical service codes from the CO, such as Camp On and Call Forwarding.

A stations's Destination Restriction level can be changed automatically with Day/Night mode Auto Scheduling. One use of this feature is to allow a telephone to make outside calls during the day, but to restrict them at night.

Through Dialing

A telephone user or an attendant can connect a destination-restricted station to a trunk enabling temporary access to an outside line. The connected station can then use external dial tone to complete the call, and revert back to destination-restricted status after the call is completed. This maintains the integrity of toll restriction, while still extending outgoing calling privileges when necessary.

Direct Inward Dialing (DID)

This feature allows external callers to dial directly to individual extensions or groups of telephones without intervention by an operator, IVR or auto attendant. Each incoming DID number, which is sent to the CTX on a DID line from the CO, can be routed individually to an extension, pooled or group line button, ACD group, maintenance modem, external page, night bell, voice mail box, or back out over the public or private telephone network. DID routing assignments can change automatically when the system switches between the Day and Night Modes.

DID numbers can vary between 1~7 digits in length for each DID line group. Each DID number can be assigned to 1 of 15 possible music-on-hold sources.

DID service is provided by DID analog, T1, or ISDN line interfaces.

Dialed Number Identification Service (DNIS)

DNIS lines receive 800- and 900-type telephone calls that provide the number the caller dialed to reach the Strata CTX. The Strata CTX translates the DNIS number into a name that displays on the telephone's LCD. This allows the user to identify where the call is coming from and the purpose of the call before the call is answered.

The DNIS Name/Number routes calls to specific telephones, departments or ACD groups. When the call is ringing and after it is answered, the DNIS Name/Number displays on the telephone's LCD. The name and number display can also be sent to an agent computer to be used by a CTI application.

Applications include sending DNIS calls to a group of agents that take orders for a number of different companies and products. The agents know how to answer the calls from the DNIS display. Using DNIS capabilities allows one group of lines to be used to serve multiple applications. DNIS service is provided by DID analog, T1 or ISDN line interfaces and provides the same call routing options and destinations as DID calls.

Digital Pad

The Strata CTX digital pad (decibel loss) is activated for the receiving path of the terminal, external line or resource.

The system adjusts for differing transmission levels between internal and external devices. This is very useful for conference calls when external parties have difficulty hearing due to public network loss. The Strata CTX can be programmed to insert the appropriate digital pad for each terminal and call type when establishing speech paths between telephones, external lines, and resources such as conference circuits, external paging devices, and external sound sources. This minimizes volume loss in conference calls.

The system recognizes these devices:

- Standard analog telephone (Type 500, Type 2500 and the equivalent)
- Toshiba digital telephone, cordless, wireless, door phone
- Analog trunk
- T1 trunk
- ISDN extension terminal (Audio and Speech)
- ISDN trunk/Tie line (Audio and Speech)
- Conference circuit
- Holding music source
- External paging device

Direct Inward System Access (DISA)

Direct Inward System Access (DISA) allows outside callers to connect to the Strata CTX and make station or trunk calls as if they were stations within the system. An incoming call may be directed to DISA by Direct Inward Dialing lines, ground/loop start lines or Automated Attendant.

Note DISA lines require DTMF receivers.

DISA security code is changeable from a specific station. The station to change the security code needs to be allowed by Class of Service. This security code can also be changed using the Strata CTX WinAdmin administration console.

DISA provides access to the features listed below:

- Station Calls
- Station Calls over Private Network
- Attendant Access
- Account Codes

DISA also provides access to these features, which require a security code:

- LCR
- Direct line access
- Outgoing line group access
- Emergency Call
- Call Forward Remote Control

Directory Numbers

A Directory Number [DN], sometimes called an “extension number,” is the number someone must call to reach a destination within the system. Each [DN] is assigned to a flexible button on a digital telephone or as the main directory number of a standard telephone. To maximize call coverage flexibility. Any [DN] can appear on multiple telephones. Also, individual telephones can have multiple [DN] buttons with different Directory Numbers.

The system provides Primary and Phantom [DN] buttons on telephones. All [DN] buttons can be used to originate and answer calls. If you press a [DN] while on a call, it releases the existing call and provides dial tone to make another call.

Primary [DN] Buttons

Primary Directory Number buttons [PDNs] are needed to make calls and receive calls. It is a telephone’s main extension number. Each telephone is assigned only one [PDN] and that telephone is designated as the owner of the [PDN]. This [PDN] button can be made to appear multiple times on the owner telephone and on other telephones (see Phantom [DN] Buttons). Features, Class of Service, etc., are associated only with the station assigned as the owner of the [PDN]. [PDNs] that appear on telephones other than the owner telephone are referred to as Secondary DNs [SDNs].

Phantom [DN] Buttons

Phantom [DN] buttons [PhDNs] are additional directory numbers appearing on telephones as extension buttons. [PhDNs] can be used as independent extensions on the phone or can appear on multiple phones to be used to allow call handling for departments or groups of telephones.

[PhDNs] can be used to make a telephone appear to have multiple [PDN] extension buttons. When assigning a [PhDN] for use as another appearance of the [PDN], the display properties are set the same as the [PDN] and a hunting sequence is set up to roll the calls from the [PDN] over to the other [PhDN]s associated with the [PDN]. With this arrangement, Call Forward will send calls to the [PDN]’s destinations and Voice Mailbox.

Pilot [DN]

A Pilot [DN] is a pseudo-location that is assigned a [DN] where calls may be directed. Unlike [PDNs] and [PhDNs], a Pilot [DN] is *not* a button on any telephone. A Pilot [DN] is used as a device where calls can ring and be held while an external application using the Computer Telephony Interface (CTI) can control the call. To ensure calls do not get lost in the Strata CTX, a time-out and overflow service is provided to redirect the call when the link is down. Calls being held on the Pilot [DN] using the CTI link can specify any of the 15 on-hold music sources that are possible on the Strata CTX.

Pilot DNs are also assigned to Station Hunt Groups (for details, refer to Station Hunting).

Distinctive LED Indicator

Each feature button on a digital telephone has a Light Emitting Diode (LED) indicator. Distinctive LED indicators provide a method for quickly identifying the status of a line or feature button. The LED color or flash pattern can identify the call you are currently on, as well as other calls you are controlling, versus other calls that may appear on your telephone. Each telephone uses dual-color LEDs: green for lines you are using; red for lines used by someone else.

Distinctive Ringing

Users sometimes need to distinguish the ringing of one button on their phone from another button and sometimes stations in close proximity to one another need to distinguish the calls on one desk from another. Typically, multiple sounds are used to provide this distinction. Strata CTX offers four different tones. Three of the tones are different pitches of a common sound and a fourth, a combination sound, is provided for a very distinguishable sound. Distinctive ringing can be assigned to each **Line** or [DN] button on each telephone.

The four distinct tones sound when the button rings with incoming outside line calls. Internal and transferred calls have another unique tone that applies to all buttons on all telephones.

Do Not Disturb (DND)

Station users with digital telephones can activate DND to prevent any calls from ringing their telephone. Callers will hear a fast busy tone when calling stations in the DND mode. Stations in DND mode can originate calls normally; however, they receive DND stutter dial tone when originating calls. Call Forward-Busy will forward calls directed to a telephone with DND set, even if the telephone has idle [DNs]. Telephones with DND Override capability can ring DND telephones (see "Do Not Disturb (DND) Override" on page 60).

Direct Station Selection (DSS) Buttons

[DSS] buttons can be placed on digital telephones, add-on modules and DSS consoles. When placed on one of these devices, these buttons serve two functions: to make direct calls or transfer calls to other stations; and to display the status of other stations and [PDNs].

The [DSS] button is numbered with a station's [PDN] and when pressed, calls that [PDN]. [DSS] buttons are not [DN] buttons, so they do not provide dial tone when pressed. The [DSS] button LED shows the status of the station and [PDN] it represents (idle, busy, DND or ringing). The [DSS] LED will turn on steady or flash at a unique rate, depending on the status (see "[DSS] Button Status Display."

The [DSS] LED displays the telephone's status for any type of call on any button, including [PhDN] and **Line** buttons. The [DSS] LED also indicates the status of the station's [PDN] itself. If the [PDN] appears as a Secondary DN [SDN] on multiple telephones, the DSS status will display Busy if any telephone is using the [SDN].

[DSS] Button Status Display

Red, steady: Busy on a call not connected to your telephone

Green, steady: Busy on a call connected to your telephone

Red, quick flash rate: Ringing

Red, slow flash rate: Do Not Disturb

DTMF Receivers

DTMF receivers are used when receiving incoming DNIS DID, Tie or DISA line calls and when originating calls with standard tone-dial telephones. Voice mail systems also require DTMF receivers for a number of VM features, even if using SMDI or Toshiba Proprietary VM integration. Four circuits are automatically active with the initial basic processor. Activation of more than four receivers requires the purchase of a DTMF software license, in four-circuit increments.

DTMF receivers require an optional ARCS subassembly on the CTX100 processor and are built into the CTX670 processor. For the number of receiver circuits, refer to Table 7 on page 13.

DTMF Back Tone

The system can be programmed to allow or prevent Dual-tone Multi-frequency (DTMF) tones from being returned to digital telephones when a user dials on outside lines or sends DTMF digits to a voice mail device.

DTMF and Dial Pulse CO Line Compatibility

When making outside calls, signals generated by pressing the dial pad buttons of a digital telephone are neither DTMF nor rotary dial signals – they are digital signals. The system can be programmed to translate these signals to either DTMF or rotary dial signals as required by the serving CO. Once the connection has been made, any further digits sent will always be sent as DTMF or rotary to allow the operation of devices at the other end of the connection.

DTMF Signal Time

DTMF tones that are sent via Speed Dial to lines and via automatic dialing to voice mail devices can be set to 80 or 160 milliseconds, or continuously. The time can be set system wide independently for line out-dialing and for voice mail automatic dialing.

Emergency Call

An Emergency Call access code can be established in the Strata CTX to route calls to specified emergency destinations and to prioritize their delivery to those destinations. Up to four emergency destinations can be programmed for each mode of operation: Day, Day2 and Night. This is particularly useful in applications where employees, patients or guests are not expected to know where to call for help at different times of the day.

Feature Prompting with Soft Keys

As an alternative to dialing access codes and using feature buttons, station users with LCD digital telephones use Soft Keys (shown on their LCD) to access features. Abbreviated feature names appear during a call (when the telephone is in the ring or talk state) on the LCD above fixed keys. Users can select a feature by pressing the associated key. The LCD feature selections change according to the call state to provide the most logical options.

Enhanced E911

Enhanced 911 calling means the routing of a call to the appropriate Public Safety Answering Position (PSAP) accompanied by Caller Emergency Services Identifier (CESID). The CESID identifies the location to which emergency services are to be sent. The Strata CTX can use two types of trunks to deliver E911 calls: ISDN Primary Rate Interface and CAMA (Centralized Automatic Message Accounting) trunks. Each 911 call generates an SMDR record at the beginning of the call to enable the business to initiate its own emergency response. Internal emergency destinations can also be automatically included in an emergency call. E911 calls can be routed across a Strata Net network for connection to the public network.

External Amplified Speaker

The External Amplified Speaker (HESB) is a six-inch, three-watt speaker with a three-watt amplifier built into a wooden speaker box. The amplified ringer can be used to:

- Amplify the ringing on a digital telephone.
- Provide a paging amplifier/speaker.
- Create an amplified talk-back speaker arrangement in an area where a telephone is not needed. The HESB is installed as a speaker and connected to a door phone unit that is used as the talk-back microphone.

Amplified ringing can improve call handling in noisy areas where non-amplified ringing on a phone may not be heard.

A paging speaker ensures that paging announcements can be clearly heard throughout an area. In an area where a DKT is not needed, a talk-back speaker provides a cost-effective communications solution.

The number of HESBs that can be installed per system depends on the function of the HESB. Any number of HESBs can provide loud ringers for digital telephones. Only one HESB can be installed if it is used as a paging or an amplified talk-back speaker.

Note A BHEU interface and an HESC-65A cable are required for each digital phone that has a loud ringing bell. A 3000- or 2000-series digital telephone that has been upgraded with a data interface unit can be upgraded with the BHEU options, but older telephone models cannot.

Flash Button

This is an optional button that can be assigned on digital telephones. It can be used either to disconnect a line and regain CO dial tone, or to gain access to Centrex features. The timing choice is set system wide through system programming. Standard telephones can dial an access code to flash Centrex lines.

Flexible Line Ringing

CO line ringing can be assigned to ring a specified [DN] on a station, a [DN] appearing on multiple stations, a Pilot [DN], a direct appearance of the CO line, a Pooled appearance of CO lines, or Group CO line appearance. These assignments direct the ringing of the incoming call based upon the three Day/Night Modes of operation and offer immediate and two delayed ringing parameters. The delay parameters are assigned for each incoming Line Group.

Flexible Numbering

The Strata CTX allows the system-numbering plan to be customized for the user's needs. Directory numbers, line and feature access codes, and Network Coordinated Numbering can be established uniquely in each system.

Handsfree Answerback

When a voice-announced internal [DN] call comes in to a digital telephone, users can answer without lifting the handset. Cordless and single line digital telephones and standard telephones are not compatible with this feature.

Headset

3000-series digital telephones may be optionally equipped with a modular headset jack by installing a BHEU PCB.

Hearing Aid Compatible

All Toshiba digital telephones are hearing aid compatible.

High Call Volume Buttons

Release, **Release**/**Answer**, and **Cancel** buttons can be assigned to digital telephones. They enable a busy user to handle calls quickly and efficiently in high call volume situations.

With one touch of the **Release** button, a user can disconnect from a call. This is especially useful in headset applications. The **Release**/**Answer** button disconnects or transfers the current call, and answers the next. The **Cancel** button voids the last operation, such as disconnecting internal or external parties from conference or tandem calls.

Hold

There are several variations of Hold:

Automatic Hold

This option enables a user to place a CO Line or [DN] call on Hold by pressing another CO Line or [DN] button. The user can then alternate between the new and the old call by pressing the desired **Line** or [DN]. If this feature is not activated, users must press **Hold** before accessing another line and switching between calls.

Analog Hold

This option enables a user to place a CO Line or [DN] call on Hold and the Line LED will flash on other DKT telephones when the call is parked. This enables the call to be picked up from other telephones. This feature must be set in programming.

Call Hold

This is the most commonly used. Call Hold temporarily suspends a call, allowing the station user to do other things, including using the phone. Callers on hold can receive music or announcements as described in the Music-on-hold feature.

Consultation Hold

This is used when invoking other call features, such as Call Transfer or Conference.

Exclusive Hold

A call can be placed on Exclusive Hold to ensure the privacy of the connection and that the call can only be retrieved by you, even if the held call appears on buttons on other telephones.

Hold Recall

After placing a call on hold, it will recall the holding telephone after a predetermined time to remind the user of the held call. The hold recall time is set independently for each telephone (from 0~255 secs.). Hold recall time can also be disabled.

Hot Dialing

Hot dialing enables the digital telephone user to begin on-hook dialing without pressing a **Line** or [DN] button. The station can be programmed to automatically select a **Line** or [PDN] button when the dial pad is pressed while the station is idle. This saves a keystroke by not requiring the station user to press a [DN] or **Line** button to begin on-hook dialing. On-hook dialing saves time by not requiring the station user to lift the handset to begin dialing.

Hotline Service

If a station remains off hook for a programmable period, it can automatically be directed (immediately or with a delay) to a pre-programmed destination. The station may have partially dialed a number or have dialed no digits at all.

Each station is programmed with its specific ring down destination. This is particularly useful in applications where employees, patients or guests are not expected to know where to call for help at different times of the day. This feature is compatible with standard and digital telephones.

Integrated Services Digital Network (ISDN)

ISDN is a set of integrated telecommunications services, available over the public telecommunications networks. ISDN makes it possible to send, receive and modify information using telephone lines in ways that were not previously possible, such as:

- Dynamic use of individual or groups of standard (POTS), DID, Tie, FX, WATS, 800 lines on an as-needed basis
- Much faster call setup and data transfer up to 128Kbps
- Multi-purpose line use, including sharing lines for voice, data, fax, and video
- DID functionality based on the number dialed; without needing to reserve a block of numbers

ISDN service comes in two forms:

- **Primary Rate Interface (PRI)** supports simultaneous voice or data connections (eight, 16 or 23). PRI is similar to digital T1 service and uses two pairs of wires from your phone company. The RPTU PCB supports PRI on the Strata CTX.
- **Basic Rate Interface (BRI)** supports up to two simultaneous connections using a single pair of wires. The Strata CTX BRI cards support both station side and trunk side connections. Strata CTX systems also support BRI interface from the public network as a CO line service. There are two types of ISDN BRI interfaces: S/T type (via RBSU/RBSS) and the U-type (via RBUU/RBUS).

Least Cost Routing (LCR)

Least Cost Routing chooses the most appropriate route over which to connect an outgoing call based on the following:

- Dialed Digits
- Time of Day
- Type of Day (Business, Weekend, Holiday)
- LCR group of the caller

The combination of routing tables, indices, route definitions and time-of-day qualifiers can produce up to 75 million combinations. Routing changes automatically for each type of day, according to the time of day. This schedule is independent of the Day/Night mode schedule which applies to ringing and CO assignments.

Line Buttons

Telephone buttons that are used for making and receiving outside calls are referred to as **Line** (or **CO Line**) buttons. (For information on various [DN] buttons, refer to "Directory Numbers" on page 51.) The Strata CTX supports the following types of line buttons:

CO Line Buttons

Smaller systems have traditionally provided the direct appearance of the CO lines on the telephones where maximum visibility of the line status, flexible ringing assignments, and informal call transfers associated with key telephone systems may be implemented.

Pooled CO Line Button

Pooled Line Group buttons enable a group of CO lines to "appear" under one button. Pooled and single appearing line buttons are designed for use with loop and ground start lines, not Tie, DID, DNIS or ANI lines.

Group CO Line Button

Group CO line buttons are like individual CO line buttons except these buttons represent all the lines for a particular ISDN Channel Group. This enables ISDN channels to operate similar to analog CO lines on a key telephone system. These buttons may have appearances on multiple telephones providing call coverage across several telephones. Multiple appearances of the same Group CO line button is possible on each phone to allow multiple call handling for that group from each station.

Live System Programming

Programming the Strata CTX from an on-site or off-site location does not interrupt the operation of the system in most cases. It is interrupted for hardware upgrades.

Lost Call Treatment

Lost Call Treatment provides the CTX a mechanism for terminating calls that cannot be terminated with the usual calling patterns. One scenario would be a call that is recalled to a station, the station user is no longer there to answer the recall and no forwarding pattern is programmed. The call will ring at the recalled station until the Lost Call Timer has expired after which the system will direct the call to the Lost Call Destination.

Message Waiting

Any station and most voice mail devices can turn on a message waiting indicator for a designated digital or standard telephone station.

LED Indication

Message waiting lights can be activated when a voice mail message has been left, or they can be turned on by a calling station. The station user can retrieve messages by pressing the button next to the message waiting light or by dialing an access code from a standard telephone.

The telephone main **Msg** light indicates a message is waiting for the telephone [PDN]. Up to four [PhDNs] per telephone can also have individual message waiting LEDs assigned to flexible buttons.

Stutter Dial Tone

Stutter dial tone is also used to indicate a message is waiting. When a station user goes off-hook, two different available stuttered dial tones indicate whether a Message Waiting (MW) or DND condition exists. The MW-stutter dial tone indicates a message is waiting for the station. DND-stutter dial tone indicates DND is set at the station. If both conditions exist simultaneously, the MW-stutter dial tone has priority. This is very valuable to station users that do not have a MW Light Emitting Diode (LED) or **DND** button LED on their telephone. (See Table 30 on page 80 for details of each type of stutter dial tone.)

Microphone (External Unit)

An external microphone (RFDM) can be connected to the DKT2020-FDSP digital telephone enhancing “full-duplex” operation by virtue of the “superdirectional” characteristic of the microphone. When this option is on, the internal microphone is disabled on all but Voice First Handsfree Answerback calls and OCA calls. The external microphone is powered by the DKT and does not need to be turned off when not in use.

Music-on-hold

Music-on-hold can be derived from a customer-supplied radio, tape player, tuner, CD player or other device to provide music or announcements to parties on hold on CO lines or on [DNs]. With the Strata CTX, you can have up to 15 MOH/BGM sources. Each CO line group and each DID/DNIS number may be assigned a specific MOH source. Stations and network Tie lines can also share a unique MOH source.

Off-Hook Call Announce (OCA)

Station users may announce a call when the station they call is busy talking with the handset off-hook. The announcement is only audible to the telephone user receiving the OCA call, not to the other party in the original conversation.

Two different methods of operation are provided – handset or speaker OCA. With handset OCA, the OCA caller’s announcement comes in on the telephone handset. With speaker OCA, the announcement comes in on the speaker. Handset or speaker OCA can be set individually for each telephone that must receive OCA calls. Speaker OCA requires a BVSU option PCB installed in the telephone that receives the OCA call. Handset OCA has no optional hardware requirement.

When a busy telephone receives a handset OCA call, replying confidentially to the OCA caller can be accomplished by pressing the **Msg** button (toggle) to place the original call on hold or holding down the **Mic** button to make a short reply. In either case, the original caller will not hear the reply to the OCA caller. To reply to a speaker OCA call, the user covers the handset mouth piece and talks back through the telephone microphone.

Any type of telephone can be enabled to originate OCA when calling a busy digital telephone. The feature is activated automatically (optional setting) or manually (Call Completion code – digit 5). Stations receiving OCA must be proprietary digital telephones assigned with OCA-receiving capability in system programming. Standard single-line telephones cannot receive OCA.

Any type of station can make an OCA call, as long as the station has this option enabled in system programming. OCA to DND telephones is allowed only if DND Override is allowed on the called and calling telephones.

Off-Premise Stations

Off-premise stations are supported using either standard analog telephones or Toshiba digital telephones. This can accommodate both individual telephones and branch office connections. Off-site standard analog telephones can be part of the system, having access to many of the features offered by the Strata CTX. Each off-site station requires a special OPX line from the CO.

Off-site digital telephones can be part of the Strata CTX system using MCK Branch Office EXTenders. This is ideal for organizations with geographically dispersed locations, extending the power of the main location’s Strata CTX to small branch offices over your existing data network.

This enables groups of remote workers to use Toshiba digital telephones to have seamless access to the main location's telephone system and voice mail system.

Remote employees have transparent access to all the same capabilities as if they were locally connected to the Strata CTX system. They have can the same ability transmitting voice traffic and digital telephone signaling over the customer's existing Local Area Network (LAN) Wide Area Network (WAN) private IP packet network or the public Internet.

Override

Call Forward Override

Stations with this feature will not forward when they call stations that have System or Station Call Forward activated. This applies when using the telephone dial pad or [DSS] button to make a call. It also applies to [DSS] buttons on DSS consoles or add-on modules associated with the Call Forward Overriding telephone.

Class Of Service Override

By dialing a Class of Service Override (COS) code, a user can change a station's class of service to one associated with the override code. When the call is terminated and another is attempted from the same station, the original Class of Service is applied. This allows selected users to override toll restriction or other restrictions that are placed on any telephone in the system.

Do Not Disturb (DND) Override

A privileged caller may invoke the DND Override feature after dialing an internal station and receiving a DND indication. If that privilege is granted to the calling station and the called station permits its DND to be overridden, the call will ring on that phone.

Executive Override

Stations with this feature allowed by COS can enter any conversation in the system by dialing a **3** or pressing a Feature Prompting Soft Key after dialing a busy station. An optional warning tone notifies the parties that another party is about to conference into their conversation. Executive Override can be blocked selectively to any station in system. Executive Override must be allowed in system programming for the called and calling station.

The Do Not Disturb feature can also be used to block Executive Override; however, stations that are allowed DND Override can use Executive Override on stations in the DND mode. The **Privacy** button does not block Executive Override.

Privacy Override

Privacy override controls the ability of multiple station users with a shared (common) **Line** or [DN] button appearance to join in each other's conversation by pressing the busy button appearance. A station must be programmed with Privacy Override to permit the intrusion on a shared **Line** or on [DN] buttons.

In the case where Privacy Override is normally allowed, a telephone can have a "Privacy" button to block Privacy Override (intrusion) to the call. The Do Not Disturb feature does *not* block Privacy Override. In the case where Privacy Override is not normally allowed, a telephone can have a "Privacy Release" button to allow intrusion to the call by any station with the shared button appearance. (See "Privacy" for more information.)

Paging

The Strata CTX has a paging interface that supports a Toshiba External Speaker (HESB) or a customer-supplied amplifiers and speakers for Paging, Night Ringing over Page, and BGM applications. Users can access any of the Paging options by dialing access codes or by using a programmed One Touch button.

Telephone Group Paging

Paging is activated from an extension by specifying a Paging Group. Paging can be broadcast through digital telephone speakers and external paging devices simultaneously. The system supports up to 16 telephone page groups with up to 32 telephones per group. Standard telephones cannot be members of a page group.

External Speaker Page Zones

The Strata CTX supports eight different paging zones for external speakers. Users can access zones by dialing an access code plus the zone or pressing a One Touch button. The zones are composed of customer-supplied speaker(s) and amplifier(s). One BIOU supports up to four page zone interfaces, a second BIOU is required for 5~8 zones.

Emergency Page

Designated stations can be permitted to place an Emergency Page to ensure they can reach all concerned with an important announcement. An Emergency Page is one that will supersede any current page to allow this privileged station to take over the paging apparatus. Like other forms of paging, an Emergency Page can be an All Page or directed to a specific Page Group and External Page Zones.

Each of the 16 Paging Groups supports up to 32 devices. Emergency Page groups follow the regular Group Paging. The list for Emergency All Call Paging is a separately defined list from regular paging. An emergency page may be answered in the same manner as a regular page.

Night Ringing Over Selected Page Zones

Lines can be programmed to night ring over eight selected Page zones via customer-supplied paging equipment. Up to two BIOU PCBs can be installed to connect external paging or night ringing equipment. Each BIOU supports up to four page zones.

Power Failure Protection

The Strata CTX has important optional capabilities that keep the system operating when commercial AC power is interrupted.

Power Failure Transfer

The Strata CTX can immediately switch loop start analog CO lines directly to dedicated standard telephones (customer-provided 2500- or 500-type) for incoming and outgoing calls in the case of a commercial AC power failure. The transfer is automatic with no manual transfer procedure required. During normal operation with AC power, the Power Failure telephones function with all Strata CTX features available to a normal standard telephone. This feature requires an external unit called the Power Failure Transfer Unit (DPFT).

Each DPFT provides interface for eight power failure telephones. A Standard Station Interface (RSTU) circuit card is required to supply the DPFT with a -24VDC control power and ground connections. The number of Power Failure telephones available depends on system configuration. The system maximum is 264.

Reserve Power Battery Backup

Two or four 12-volt gel-cell, maintenance-free batteries can be connected to the CTX system power supplies for system battery backup (80 amps./hours max.). The CTX670 system power supply is standard-equipped with a battery charger and the batteries continuously trickle charge to capacity while electrical power is present. The CTX100 power supplies must be equipped with the optional ABCS battery charger to charge reserve power batteries.

If the AC power fails, the Strata system automatically switches over to battery power without any interruption in operation. Calls in progress are not interrupted. Battery operation duration depends upon the condition and ampere hour rating of the batteries and the system load. However, the minimum battery operation time would be several hours. Connection of reserve power batteries must be made when commercial AC power is available.

Privacy

Privacy prevents intrusion on calls that appear on shared (common) [DN] or line buttons. If a telephone has a call on a [DN] or line button that appears on other telephones, the other telephones cannot intrude on the call by pressing the shared button unless the intruding telephone has the Privacy Override feature or the telephone with the call activates the **Privacy Release** button.

Repeat Last Number Dialed

This feature enables a digital station to automatically redial the last number dialed from their station by selecting an outgoing line and pressing the **Redial** button or by dialing an access code. Digital key telephones have a fixed **Redial** button for automatic redialing of the last number dialed.

Ring Over Busy

When a digital telephone is busy on a call and then receives an internal or external call on an idle [DN] or line button, the button will automatically flash and ring with Ring Over Busy tone. The tone burst can either be sent two times (three seconds apart) or repeated continuously every three seconds or not sent as a station option. To answer a Ring Over Busy call, the user can hold, transfer or disconnect the existing call.

On Voice First calls to a busy telephone that has an idle [DN], the caller will get busy tone. The caller can then dial the digit **1** to cause the idle [DN] to Ring Over Busy.

Speed Dial

This feature, sometimes known as automatic dialing or one-touch dialing, enables the customer to assign dialing codes to telephone numbers that are frequently called. Strata CTX offers three forms of Speed Dial: System Speed Dial (up to 800 max. per system), Station Speed Dial (100 max. per station), and One Touch buttons. Station Speed Dial numbers and One Touch buttons are unique for each station and cannot be used by other stations. System Speed Dial numbers can be used by any station in the system.

To dial System and Station Speed Dial numbers, the user presses the **Spdial** button and then dials the appropriate three-digit code for the telephone number to be dialed. To dial a telephone number assigned to a One Touch button, the user simply presses the One Touch button. Users can program Station Speed Dial and One Touch buttons from their telephones.

CTX WinAdmin is required to program System Speed Dial numbers and can also be used to program Station Speed Dial numbers, but not One Touch button numbers. Each Station and System Speed Dial number can be assigned a nine-character name using CTX WinAdmin.This name appears in the DKT3014 large LCD screen System Speed Dial and Personal Speed Dial directories.

One Touch Buttons

One touch buttons enable users to store speed dial and custom feature access sequences on a single button. When this button is pressed, the stored number is dialed or the feature is accessed.

You can store frequently dialed numbers, such as the three-digit System Speed Dial codes, onto a One Touch button. This eliminates the need to enter the three-digit code to dial a System Speed Dial number. Complete telephone numbers up to 32 digits can also be stored on a One Touch button.

These buttons make it easy to access features that usually require pressing multiple buttons and/or dialing special access codes. For example, a user may have to dial an access code (**#31**) plus a zone number (**5**) to page the warehouse. This sequence can be set on a One Touch button labeled “Page Warehouse.” Another button can be set to page a particular group of telephones.

The One Touch button also has a “stop” function that can be entered between two numbers, such as a telephone number and security code. When the One Touch button is pressed, it can speed dial a telephone number, then pause (LED flashes). When the call is answered, it prompts for a security code. The user can then press the flashing button and enter the security code. Any number of “stops” can be set to enable dialing multiple numbers.

Multiple feature buttons such a **Cnf\Trn**, [DN], CO line, etc., can be set on One Touch buttons to allow multiple button presses to be stored under one button. This enables tandem line connections and other call setup sequences to be dialed easily by pressing one button.

Station Hunting

A series of Directory Numbers (DNs) can be organized in groups in such a way that if a called [DN] is busy the call will try to ring another [DN] in the group. If that [DN] is busy it will hunt to a third [DN], etc. Telephones in the same department, voice mail ports and boss/secretary call coverage situations are typical applications for hunt groups. Hunt group members can remove themselves from the group by placing their station into the Do Not Disturb mode. The system supports three types of station hunting:

Serial Hunting

In this type of hunt group, calls hunt [DNs] in a series from first to last in a specific order. When any [DN] in the series is called, the system will ring the first idle [DN] in the series, starting with the called [DN], hunting to the last [DN] in the series. As an option, this type of hunt group can have a unique Pilot [DN] assigned to it. When callers dial the Pilot [DN] to reach a telephone in the group, calls will hunt all [DNs] from first to last.

Circular Hunting

In this type of hunt group, calls hunt [DNs] in a series in a specific order; however, the series forms a loop, which enables the last [DN] to hunt to the first [DN]. When any [DN] in the series is called, the system will ring the first idle [DN] in the series, starting with the called [DN], hunting to all [DNs] in the series. As an option, this type of hunt group can have a unique Pilot [DN] assigned to it. When callers dial the Pilot [DN] to reach a telephone in the group, calls will hunt all [DNs] from first to last.

Distributed Hunting

This type of hunt group always has a unique Pilot [DN] assigned to it. Callers dial the pilot [DN] to reach a telephone in the group. Calls hunt in such a way so as to distribute the calls evenly to each [DN] in the group. Hunting rotation always starts in sequence with the [DN] that follows the [DN] that received the last call – even if all other [DNs] are idle.

Camp on to Hunt Groups

On incoming CO line calls to busy hunt groups, the caller automatically camps on to the called [DN] or Pilot [DN] and the caller receives ring-back-tone.

On internal calls to busy hunt groups, the caller may get busy tone. The caller can then dial a digit to initiate Camp On-Busy to the called, busy [DN] or the Pilot [DN], if used. As an option, for each hunt group that uses a Pilot [DN], calls will automatically camp on to the called Pilot [DN].

With the Automatic Camp On option, the caller does not get busy tone, instead the caller receives confirmation tone followed by ring-back-tone. When using hunt group Pilot [DNs], camped on calls queue onto all [DNs] in the group and will connect to any [DN] in the group that becomes available. When not using Pilot DNs, Camp On is only applied to the called [DN].

When more than one party is camped on (queued) to a hunt group, the party with the highest Queuing Priority Level (QPL) will be connected first when the destination becomes available. If the parties have the same QPL, the longest waiting call will be connected first.

Station Message Detail Recording (SMDR)

For each incoming, outgoing or tandem call, the Strata CTX can generate a record that includes details of the call, including the originating station or trunk, the start time of the call, its duration, authorization codes, etc. If a station user dials “911,” the Strata CTX will also generate a record at the beginning of the call as part of its internal notification that an emergency call is in progress. SMDR requires an optional BSIS interface PCB and a connected Call Accounting system.

Strata Net Multi-system Networking

Strata Net is a private networking application based on QSIG, an international standard for the interconnection of PBX. Strata Net delivers a rich set of calling features across multiple Strata CTX systems distributed throughout the enterprise. Users benefit from transparent dialing and simple feature operation.

Advanced networking features include Centralized Voice Mail, Centralized Attendant and Network Station Message Detail Reporting (SMDR). Alternate Routing provides for toll bypass configurations and automatic recovery from network disruptions.

Strata CTX systems are interconnected with DS1 (T1) circuits to provide ISDN-type inter-connectivity. DS1 circuits may be leased from public carriers, derived from Frame Relay or IP networks, or connected across twisted-pair cabling or fiber optics.

Up to 128 nodes can be accommodated within the Strata Net numbering plan. Up to four nodes connected in tandem can give satisfactory performance with regard to latency. As with any network design, transport, delay speech volume and other issues must be carefully considered.

Coordinated Numbering Plan

Strata Net can be configured to allow users to call each other across network nodes with simple network directory numbers. This eliminates the user’s need for access codes and network maps. Calls that encounter a busy or unanswered destination can be forwarded to any node in the network, including a centralized voice mail system or attendant.

QSIG Basic Call Control

The Strata CTX conforms to the QSIG standard for Basic Call Control. This is the basis for all Strata Net connectivity and interoperability with PBXs from other manufacturers. Basic Call Control provides for connection, dialing, identification of calling and called parties’ names and numbers and message waiting indications among other features. Toshiba does not guarantee interoperability with other manufacturer’s products: only conformance to the standard.

Alternate Routing

Each Strata CTX can be programmed for thousands of routing patterns for Strata Net alone. This allows the creation of networks in which calls can be automatically re-routed around network disruptions. Centralized facilities and features can continue to work and users will be unaware of problems while they are being repaired.

Alternate Routing also permits Toll Bypass in which Strata Net can be used to deliver a public call from a point in the network where toll charges are minimized. Such a scheme is known as “Hop Off” for the ability of the private network to determine the point at which the call will hop off to the public network.

Centralized Attendant

One attendant can serve an entire Strata Net. Station users only need to dial “0” to reach the centralized attendant regardless of the node in which they reside. The attendant can reach any station in the network using its Network Directory Number. Trunks attached to any network node can be programmed to terminate to the centralized attendant and their source and calling party information will be delivered to the attendant’s display.

Centralized Voice Mail

A voice mail system attached to any Strata Net network node can serve users throughout the enterprise. Unanswered calls will be forwarded to the voice mail, the source and calling conditions identified and the appropriate voice mailbox greeting will be played. The voice mail system can control message waiting indications throughout the network as messages are left and retrieved. A single network can even support multiple centralized voice mail systems with each station being programmed for the appropriate system.

Network SMDR

An external Strata Net call will generate a call record at the terminating node for that call. Transit nodes will not generate records. The records can be stored in customer-supplied external buffers at each node. Polling call accounting software can gather and organize the data from multiple nodes. Local buffering provides survivability in the event of network disruption.

System Fault Finding and Diagnostics

The Strata CTX can detect problems in the system. These conditions can be detected, alerted, logged, and traced. Strata CTX includes many useful diagnostic tools.

Alarm Indication of System Faults

Visual Alarms are presented to CTX WinAdmin and attendant consoles.

SmartMedia Card

This is a small memory card that is commercially available in retail stores. It is the same as SmartMedia cards used in digital cameras, MP3 players, etc.

The Strata CTX uses the SmartMedia card to store all error, trace logs and a backup copy of the system operating software and the customer database. The SmartMedia card is inserted into a socket on the CTX processor. The CTX processor creates directories and files onto the card for maintenance functions. Using CTX WinAdmin enables moving, copying, or deleting these files without having to remove the SmartMedia card from the CTX processor. With CTX WinAdmin, this works locally or remotely. SmartMedia files can also be managed by removing the SmartMedia card from the CTX processor and inserting it into a PC SmartMedia card read/write adapter.

Fault Detection and Error Logs

The Strata CTX detects and logs abnormalities that it encounters during operation. All error and trace logs are stored on the SmartMedia card on the system processor and are monitored by CTX WinAdmin. Examples are trunk failure detection and auto busy-out, digital telephone port failure detection and auto busy-out plus error log, Expansion Cabinet power supply failure alarm and error log, etc.

Event and System Administration Logs

Events such as station buttons pushed or lines accessed are stored in an Event Log. All actions made by the System Administration user are logged. Both logs may be called up at a later time.

Automatic Fault Recovery

The system can automatically correct certain conditions detected during operation. This enables the system to continue operating normally without requiring correction.

System Trace

The system records telephone key strokes and other high level events and presents the data in a format understandable and useful to the field technician for troubleshooting purposes. The system also records more detailed data useful to a software support engineer.

Manual Test

The maintenance technician can perform certain test functions using CTX WinAdmin to determine proper operation of the system.

Backup/Restore

The customer database can be backed up and restored using the SmartMedia card. The customer database is a file that can be stored on the SmartMedia card, transferred to the PC hard drive, e-mailed, etc.

Maintenance and Administration

The CTX WinAdmin terminal can be connected directly to the Strata CTX or via the customer's LAN as well as remotely over the internet and via modem over the public network. The Strata CTX processor comes standard with a network interface port and a built-in modem.

Software Upgrade

The Strata CTX operating software can be upgraded using the SmartMedia card or by downloading it from a remote location. The operating software is a file that can be stored on the SmartMedia card, transferred to the PC hard drive, e-mailed, etc.

Transfer

Transfer is the ability to redirect a connected call to new destination. The Strata CTX provides three means of transferring a call and three means of terminating transferred calls, depending on the calling state of the destination. The transferring features and the terminating features may be used in combination to serve most needs that arise.

Transfer with Camp On

This feature enables the transfer of a call to a busy destination. The transferred party automatically camps on to the busy destination when the transferring party releases the call.

Transfer Immediate

Call Transfer Immediate simplifies the transfer of calls for users of digital display telephones. With a conversation in progress, the display phone user presses the **TRNS** Soft Key and dials the transfer destination. The calling party is placed on Consultation Hold, the call immediately transfers and the transferring phone returns to idle. This feature does not apply to network calls.

Transfer Privacy

An outside call that has been transferred can only be answered at the station to which the call has been transferred. Another station cannot pick up the transferred call using a common CO line button unless it is another station using the Directed Call Pickup feature or a station that has a [DN] appearance of the “transferred to” [DN]. A flashing red LED indicates the call is transferred. Privacy for transferred calls can be disabled in programming.

Transfer (Screened)

The transferring party can talk privately with the receiving party before connecting the party to be transferred. While that conversation is going on, the transferred party is on Consultation Hold listening to Music-on-hold. When the receiving party agrees to accept the call, the transferring party can use the switch hook or feature button to include the original party in the conversation. At this point, the transferring party can hang up and the other two parties remain connected.

Transfer (Unscreened)

Unscreened Transfer allows the transferring party to exit the connection before the transfer destination answers. After the destination answers the call, the system treats it as a regular call. If the destination does not answer the call within the predetermined time of period, the transferring party is recalled.

Transfer to Voice Mail

See “Direct Transfer to Voice Mailbox” on page 70.

Music or Ringing Option

This feature enables ringing or music to be heard by the caller when their call is transferred, depending on system programming.

User Programming Mode

Digital telephone users can use the programming mode for customizing their Toshiba telephones without the aid of an Administrator or Service Technician. The User Programming mode is accessed with a **Program** button assigned to a flexible button or through an access code. User Programming enables users to customize these features:

- **Flexible Buttons** – Toshiba telephones have 10, 14, or 20 flexible buttons to which the user can assign any one of approximately 50 different features (DND, ACB, Release, etc.). Once assigned to a button, the feature is accessed by pressing that button. Some buttons have parameters that users can set. These include:
  - **Call Forward** – Users can set the Call Forward (CF) destination and CF-No Answer Timer for the CF buttons.

- **One Touch** – Users can set speed dial and custom feature access code sequences for One Touch buttons.
- **Background Music** – Users can select the music source (up to 15 sources) that will play on their telephone's speaker when they activate the **BGM** button.
- **Ring tones** – **Line** and [DN] button ringing tones can be changed to one of four different tones. These tones apply to direct or transferred incoming calls from outside lines, not internal calls.

Note Directory number and external line buttons cannot be added or deleted, but their ring tones can be individually changed.

In addition to the Programming Mode, an advanced programming function enables administrators to individually turn On/Off the telephone's beep tone, handset call waiting tone, and microphone background noise cancellation option. This mode enables LCD contrast adjustment and testing the DKT3014 large LCD screen.

Voice or Tone Signaling

Each [DN] button can be programmed for either Voice or Tone Signaling as the standard method of internal incoming call signaling. Tone Signaling rings the telephone when a call comes in and ensures better privacy. With Tone Signaling, the called telephone receives a one-second ring tone every three seconds. The pitch and sound of internal tone signaling is always the same. Incoming CO line ringing is uniquely different, with up to four optional ring tone sounds.

With Voice Signaling, station users will hear a tone burst followed by the caller's voice over their telephone speaker when called by another station user locally or over the private network. Voice Signaling allows handsfree talkback from the called telephone on internal and private network Tie line calls.

After calling a directory number that has Voice Signaling, the caller can switch to Tone Signaling by dialing **1**. The signaling method can also be switched from Tone to Voice Signaling by dialing **2**. Whether a call is initiated with Tone or Voice Signaling, it can always be switched back and forth by dialing **1** or **2**.

Note A call to a Voice Signaling [DN] will not Call Forward No Answer unless the signaling is switched from Voice to Tone Signaling.

Voice Mail Integration

The CTX670 supports Dual-tone Multi-frequency (DTMF) integration, Simplified Message Desk Interface (SMDI) integration, and Toshiba Proprietary integration.

DTMF Integration

DTMF integration uses DTMF strings to pass and interpret information between the Strata CTX and a voice mail system. DTMF integration can be used with any compatible voice mail system. It does not require optional hardware interface.

Simplified Message Desk Interface (SMDI)

SMDI is an industry standard method of integrating a telephone system with voice mail or other peripheral systems. This interconnection is made via an RS-232 data connection. SMDI requires the BSIS interface in the Strata CTX. SMDI integration can be used with any compatible voice mail system.

Toshiba Proprietary Integration

Toshiba proprietary integration provides the highest functionality between the Strata CTX and a Stratagy voice processing system. Toshiba proprietary integration requires the BSIS interface for control signaling between Stratagy and Strata CTX. Toshiba proprietary integration is required to use Stratagy voice processing system's support the features of Call Record to Voice Mail and Voice Mail Soft Keys.

Call Record to Voice Mail

While on an active call, a station user can record the conversation and store it in a Stratagy ES voice mailbox by pressing **Record** on the digital telephone. To end the recording, they can press **Record** again. Station users can also stop and start recording by pressing **PS/RES**.

Users can replay recorded messages by calling the voice mailbox that has the stored recording and play it back as any other message. The "record to" mailbox can be any mailbox number and can be accessed automatically when **Record** is pressed or dialed after **Record** is pressed.

Recording to Voice Mail (VM) is available on two-party and multi-party conference calls.

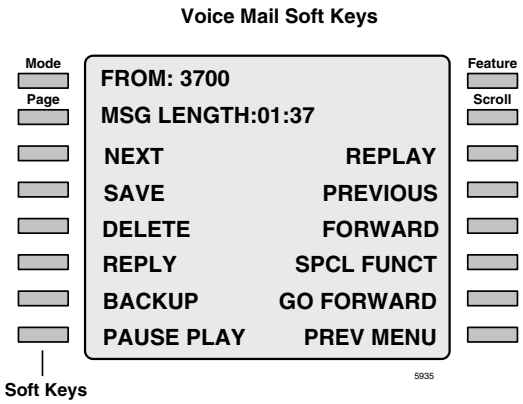
Voice Mail Soft Keys (Stratagy ES/iES32 Only)

Voice Mail Soft Keys provide LCD telephone users with an active set of Soft Keys that prompt the user with available commands to play Voice Mail messages and to manage their mail boxes (shown right).

The LCD shows the number of New and Saved messages in the user's mailbox.

The number of New/Saved messages displays on the LCD when the telephone is idle and has at least one new message.

Soft Keys requires the Toshiba Proprietary VM integration and connection to the Strata CTX LAN.



Direct Transfer to Voice Mailbox

The transferring party can transfer a call directly to a person's voice mailbox without waiting for the call to forward from the called party's telephone. The voice mailbox does not need to be associated with an active telephone in the Strata CTX. Direct transfer to voice mail (VM) can be performed to a centralized VM system connected to a network node other than the user's node.

The transferring party presses **Direct Transfer to VM** and dials the mailbox number, and the call transfers immediately on receipt of the last digit. The transferred party hears the greeting associated with the specified mailbox and can then leave a message.

Direct Transfer to Voice Mailbox simplifies getting a call for a busy or absent employee to his/her mailbox. It eliminates the need for the caller to enter the desired mailbox number after being connected to the voice mail system. This feature is available using standard DTMF or SMDI VM integration and does not require Toshiba proprietary VM integration.

Volume Control

Digital Telephone users can independently adjust their handset hearing volume, speaker hearing volume including BGM, speaker incoming tone volume and beep tone volume.

Appendix – Specifications

This appendix includes detailed information on the items listed below. The sections in this appendix apply to both the Strata CTX100 and CTX670, unless otherwise stated.

- Environmental Characteristics
- CTX100 Power Considerations
- CTX670 Power Considerations
- Reserve Power
- Hardware Compatibility
- Public Network Requirements
- Station Loop Lengths
- Standard Telephone Ringer Specifications
- 3000-series Telephone Option PCBs
- Station Dimensions
- System Tones

For further details, refer to the *Strata CTX I&M Manual.*

Environmental Characteristics

The environmental requirements for either system are shown in Table 17.

Table 17 Environmental Characteristics for the CTX100 and CTX670

Environmental Specifications	
Operating temperature Operating humidity Storage temperature	32~104° F (0~40° C) 20~80% relative humidity without condensation -4~140° F (-20~60° C)
BTU Rating	
ACTU (1) or BECU/BBCU (1 installed) BDKU (5 installed) RCOU/RCOS (1 installed) Digital Telephones (40 installed)	CTX100: 105 BTUs (31 watt hours) per cabinet. CTX670: 190 BTUs (56 watt hours) per cabinet.

CTX100 Power Considerations

The power supply in each CTX100 Base and Expansion Cabinet furnishes power to all of the stations and some of the interface peripherals (see Table 18). The primary AC power for each cabinet is 120VAC.

Table 18 CTX100 Electrical Characteristics

CTX100 Primary AC Power Voltage	
Input AC AC Frequency Watts per cabinet (maximum)	120VAC 60 Hz, Single-phase (48Hz~62Hz) 100 watts (maximum)
CTX100 Primary Power Current Consumption (Rating in Amperes)	
	120VAC
1 cabinet	1.8 amps
2 cabinets	3.6 amps
Power Supply Unit (APSU112A)	
DC voltage output specification	-24VDC (-26.3~-27.8VDC, 3.2 DC amps) +5VDC (+4.5~5.5VDC, 2.0 DC amps) -5VDC (-4.5~-5.5VDC, 0.2 DC amps) +3.3VDC (+3.0~3.6VDC, 0.5 DC amps

CTX670 Power Considerations

The power supply in each CTX670 Base and Expansion Cabinet furnishes power to all of the stations and some of the interface peripherals (see Table 19). The primary AC power can be 120VAC, 208VAC or 240VAC. Systems containing six or seven cabinets require 208VAC or 240VAC.

Table 19 CTX670 Electrical Characteristics

CTX670 Primary AC Power Voltage			
Input AC AC Frequency Watts per cabinet (continuous) Watts for five cabinet system	115±10VAC or 208±20VAC or 240±20VAC 50/60 Hz, Single-phase (48~62Hz) 180 900		
CTX670 Primary Power Current Consumption (Rating in Amperes)			
Number of Cabinets:	120VAC	208VAC	240VAC
1	3.2 amps	2.2 amps	2.0 amps
2	6.4 amps	4.4 amps	4.0 amps
3	9.6 amps	6.6 amps	6.0 amps
4	12.8 amps	8.8 amps	8.0 amps
5	16.0 amps	11.0 amps	10.0 amps
6	N/A	13.2 amps	12.0 amps
7	N/A	15.4 amps	14.0 amps
Power Supply Unit (BPSU672)			
DC voltage output specification	-24VDC (-26.3~-27.8VDC, 6.0 DC amps) +5VDC (+4.5~5.5VDC, 4.0 DC amps) -5VDC (-4.5~-5.5VDC, 0.8 DC amps)		

Reserve Power

Two or four customer-supplied 12VDC reserve batteries (80 ampere-hours max.) can be connected to either system to maintain normal operation during a power failure (see Tables 20~23). The batteries are kept in a highly-charged state by the power supply's battery charger and must be connected when the system is operating normally. Fully charged batteries must be connected when normal AC power is available, batteries cannot be connected after/during an actual power failure.

The battery changer is standard on the CTX670 power supply. An optional ABCS battery changer must be used in the CTX100 power supply.

Table 20 CTX100 Reserve Power Characteristics

Battery Charger Characteristics	Maximum Battery Charger Drain (-24VDC)	
Charger: current limiting Nominal float voltage: 2.275 volts/cell Charge current: 280mA amps maximum Battery discharge cut-off voltage: 20.5 ±0.5VDC	Base Cabinet Base + Expansion Cabinets	3.15 amps 6.30 amps

Table 21 CTX100 Typical Reserve Power Duration Estimates[1]

Number of Cabinets	1	2
Estimated operation time Two-battery configuration	25 hr.	12.5 hr.
Estimated operation time Four-battery configuration	50 hr.	25 hr.
DC Current Drain (-24VDC)	3.15 amps.	6.30 amps.

1. Assumes 80 ampere-hours with 12VDC batteries.

Table 22 CTX670 Reserve Power Characteristics

Battery Charger Characteristics	Maximum Battery Charger Drain (-24VDC)			
Charger: current limiting Nominal float voltage: 2.275 volts/cell Charge current: 0.7 amps maximum Battery discharge cut-off voltage: 20.5 ±0.5VDC	1 cabinet 2 cabinets 3 cabinets 4 cabinets	6.0 amps 12.0 amps 18.0 amps 24.0 amps	5 cabinets 6 cabinets 7 cabinets	30.0 amps 36.0 amps 42.0 amps

Table 23 CTX670 Typical Reserve Power Duration Estimates[1]

Number of Cabinets	1	2	3	4	5	6	7
Estimated operation time Two-battery configuration	12.0 hr.	6.0 hr.	4.0 hr.	3.0 hr.	2.5 hr.	2.0 hr.	1.8 hr.
Estimated operation time Four-battery configuration	24.0 hr.	12.0 hr.	8.0 hr.	6.0 hr.	5.0 hr.	4.0 hr.	3.5 hr.
DC Current Drain (-24VDC)	4.6 amps.	8.7 amps.	12.8 amps.	16.9 amps.	21.0 amps.	25.1 amps.	29.2 amps.

1. Assumes 80 ampere-hours with 12VDC batteries.

Hardware Compatibility

PCB compatibility for the Strata DK280, DK424, DK424i, CTX100 and CTX670 systems is shown in Table 24.

Table 24 Hardware Compatibility

Category	Unit Name	DK280 & DK424	DK424i	CTX100	CTX670
Processor Card	BECU/BBCU with optional BBMS, BEXS, BSIS	NC	NC[1]	NC	X
	B_CAU/B_CBU cards for DK424i	NC	X	NC	NC
	RCTU cards for DK424	X	NC	NC	NC
	ACTU and BSIS, AETS, AMDS, ARCS subassemblies	NC	NC	X	NC
DTMF Receiver Unit	BRCS-4/8/12	X	X	NC	NC
	RRCS-4/8/12	X	NC	NC	NC
	ARCS (16)	NC	NC	X	16/32 Built-in
Optional Interface Unit	BIOU	NC	NC	X	X
	PIOU	X	X	NC	NC
	PIOUS	X	X	NC	NC
	RSIU	X	X	NC	NC
	RSSU	X	X	NC	NC
Standard Telephone Interface	RSTU3, RDSU/RSTS	X	X	X	X
Electronic Telephone Interface	PEKU, PESU	X	X	NC	NC
Digital Telephone Interface	ADKU	NC	NC	X	NC
	BDKU	X	X	X	X
	BDKS	NC	NC	X	X
	PDKU2 (2000-series digital phones only)	X	X	X	X
	RDSU (2000-series digital phones only)	X	X	X	X
CO Line Interface	RGLU2	X	X	X	X
	RCOU/RCOS	X	X	X	X
	REMU	X	X	X	X
	RDTU2	X	X	X	X
ISDN Interface	RBSU/RBSS	X[2]	X	X	X
	RBUU/RBUS	X[2]	X	X	X
	RPTU2	X[2]	X	X	X[3]
Terminal	EKT2000, EKT6000, EKT6500, HDSS, HDCB	X	X	NC	NC
	Existing Proprietary Attendant Console	X	X	NC	NC
	DK424 PC Attendant	X	X	NC	NC
	Strata CTX PC Attendant Console, BATI	NC	NC	X	X
	RPCI (RS-232C) - Data or TAPI	X	X	NC	NC
	BPCI (RS-232C) - Data or Voice Record TAPI	NC	NC	X	X
	DKT1000[4]	X	X	X	X
	DKT2000	X	X	X	X
	DKT3000	X[5]	X[4]	X	X
Ethernet LAN	AETS	NC	NC	X	Built-in
V.34 Admin Modem	AMDS	NC	NC	X	Built-in
Base Cabinet	DKSUB424 or DKSUB280	X	NC	NC	NC
	CHSUB672	NC	X	NC	X
	CHSUB112	NC	NC	X	NC

Table 24 Hardware Compatibility *(continued)*

Category	Unit Name	DK280 & DK424	DK424i	CTX100	CTX670
Expansion Cabinet	DKSUE424	X	NC	NC	NC
	CHSUE672	NC	X	NC	X
	CHSUE112	NC	NC	X	NC
	Data Cable for Strata DK424 Expansion Cabinet	X	NC	NC	NC
	Data Cable for CTX670 Expansion Cabinet	NC	X	NC	X
	Data Cable for CTX100 Expansion Cabinet	NC	NC	X	NC
Power Supply Unit	RPSU424 (120VAC)	X	NC	NC	NC
	BPSU672 (120VAC/208VAC/240VAC power supply)	NC	X	NC	X
	APSU112 (120VAC)	NC	NC	X	NC
Conduit Connection Box	RCCB2	X	NC	NC	NC
	BCCB120 (120V box)	NC	X	NC	X
	BCCB240 (240V box)	NC	X	NC	X
Battery Distribution Box	RBDB2	X	NC	NC	NC
	BBDB1 (new Battery Dist. Box, 7 BBTC2A-2.0M)	X	X	NC	X
Power Strip	RPSB1 (120VAC power strip)	X	NC	NC	NC
	RPSB2 (120VAC power strip)	X	X	NC	X
	BPSB240 (240VAC power strip)	NC	NC	NC	X
Battery Cable	PBTC-3M	X	X	NC	X
	BBTC1A-2.0M	NC	X	NC	X
	ABTC-3M	NC	NC	X	NC
Battery Charger	ABCS1	Built-in	Built-in	X	Built-in

X = Compatible **NC = Not Compatible**

1. If the BECU/BBCU replaces the DK424i processors, then the system is upgraded to a CTX670.
2. Requires Release 4.x software.
3. RPTU2 is required for QSIG Networking.
4. DKT1000-series telephone do not support continuous DTMF tones.
5. Functions as a DKT2000.

Public Network Requirements

The PCB requirements for connecting to the public network are shown in Table 25.

Table 25 PCB Network Requirements

PCB/Interface	Facility Interface Code	Network Jack	Ringer Equivalence	Universal Service Order Code
RSTU3/RDSU[1] (Off-premises Station)	OL13B (RSTU3, –24V) OL13C (RSTU3, RDSU with R48S-48V)	RJ21X	N/A	9.0F
RCOU/RCOS[2] (loop start line)	02LS2	RJ14C/RJ21X (all others)	0.3B	N/A
RDDU	02RV2-T (Dealer-supplied CSU)	RJ14C/RJ21X	0.0B	AS.2
REMU type 1 or type 2	TL11M, 2-wire TL31M, 4-wire TL12M, type 2, 2-wire TL32M, type 2, 4-wire	RJ2EX RJ2GX RJ2FX RJ2HX	Not Available (N/A)	9.0F
RGLU2 (ground or loop start line)[2]	02GS2 (ground) 02LS2 (loop)	RJ14C/RJ11CX	0.3B	N/A
RDTU (DS-1/T1)[3]	(See last bullet note on Note 2 below.)	RJ48C/RJ48X/ RJ48M	N/A	6.0P
RCIU2/RCIS (Caller ID)	N/A	RJ21X/RJ14C	0.3B	N/A
RPTU (PRI)[4, 5]	04DU9-1SN (Dealer-supplied CSU)	RJ48C/RJ48M	N/A	6.0P
RPTU (QSIGI)	04DU9-1SN (Dealer-supplied CSU)	RJ48C/RJ48M		
RBSU/RBSS (S/T, BRI)[3]	02IS5 (Dealer-supplied NT-1)	RJ48C/RJ48X		
RBUU/RBUS (U, BRI)[3]	02IS5	RJ48C/RJ48X		
RMCU/RCMS (CAMA)	02RV2-O	RJ11C/RJ21-X		

1. Only RDSU ckts. 1~4 provide Off-premises Station (OPS) ability. RDSU must use OL13A or OL13B if providing –24 volt loop voltage. If equipped with the –48 volt loop option PCB (R48S), OL13A, OL13B, or OL13C may be used for OPS connection.
2. Loop current requirements for Strata loop and ground start lines: 20 milliamperes (mA) min./120 mA max.
3. When ordering DS-1/T1 circuits, six items must be specified:
   - The number of channels per T1 circuit, fractional increments are normally 8, 12, or 16 channels, full service is 24 channels. Unused channels must be bit-stuffed.
   - CO line types assigned to each channel: Loop Start, Ground Start, Tie (Wink or Immediate Start), DID (Wink or Immediate).
   - Frame Format Type: Super Frame (SF) or Extended Super Frame (ESF). The T1 provider normally specifies the Frame Format to be used, either is adequate for CO digital voice lines. ESF provides a higher level of performance monitoring, but requires trained personnel and the ESF CSU normally costs more than an SF only CSU.
   - Line Code Type: Alternate Mark Inversion (AMI) or Bipolar 8 Zero Substitution (B8ZS). The T1 provider normally specified the Line Code to be used, either is adequate for T1 CO digital voice lines.
   - The customer may have to provide the Channel Service Unit (CSU) to interface the CTX T1 circuit to the Telco T1 circuit. (CSUs are a Telco requirement.)
   - RDTU Network Channel Interface Codes: 04DU9-BN, 04DU9-DNZZ, 04DU9-1SN, 04DU9-1KN, 04DU9-1ZN.
4. For information on how to order ISDN PRI/BRI circuits, you should refer to the Toshiba ISDN Training CBT. ISDN circuits may require a customer-provided CSU for PRI and/or Terminal Adapter or Network Terminal units for BRI. In U.S. CSU/TAs must be UL-listed in the U.S. In Canada, they must be CSA certified.
5. RPTU2 is required for QSIG private networking.

Station Loop Lengths

In a single site installation, the Base and optional Expansion Cabinets must be placed within the allowed maximum distance of each other as designated by Table 26.

Table 26 Station Loop Lengths[1]

<table>
<tr><th rowspan="2">Mode</th><th colspan="3">Maximum line length (24 AWG)</th></tr>
<tr><th>1 Pair</th><th>2 Pair</th><th>1 Pair plus external power [2]</th></tr>
<tr><td>DKT3000 or DKT2000-series[3]</td><td rowspan="6">1000 ft. (303m)</td><td rowspan="8">1000 ft. (303m)</td><td rowspan="8">1000 ft. (303m)</td></tr>
<tr><td>DKT with BVSU or DVSU</td></tr>
<tr><td>DKT with BHEU or HHEU</td></tr>
<tr><td>DKT with BPCI</td></tr>
<tr><td>DKT with BPCI + BHEU</td></tr>
<tr><td>DKT with BVSU + BHEU or DVSU + HHEU</td></tr>
<tr><td>DKT with DADM3020 or DADM2020 (1 ADM)</td><td>675 ft. (204m)</td></tr>
<tr><td>DKT with DADM3020 or DADM2020 (2 ADMs)</td><td>500 ft. (151m)</td></tr>
<tr><td>DDSS3060 or DDSS2060</td><td rowspan="3">1000 ft. (303m)</td><td rowspan="2">n/a</td><td rowspan="2">n/a</td></tr>
<tr><td>BATI, RATI</td></tr>
<tr><td>DDCB3</td><td>1000 ft. (303m)</td><td>1000 ft. (303m)</td></tr>
<tr><td rowspan="3">Standard telephones, voice mail, AA, etc.</td><td>Approx. 3000 ft. (909 m) with 150 ohm device.[4]</td><td rowspan="3">n/a</td><td rowspan="3">n/a</td></tr>
<tr><td>Approx. 9000 ft. (2727 m) with 150 ohm device.[4]</td></tr>
<tr><td>Approx. 21000 ft. (6363 m) with 150 ohm device.[4]</td></tr>
</table>

1. When the system is powered by backup battery, range may be less as the backup battery is discharged.
2. Two-pair wiring or optional telephone power supply is required to achieve maximum range in all cases.
3. BDKS does not provide the power wire pair, an external power supply is required to achieve maximum range.
4. See manufacturer's product specifications for exact resistance of device.

Standard Telephone Ringer Specifications

Specifications for standard telephone ringers appear in Table 27.

Table 27 Standard Telephone Ringer Specifications

RSTU3 or RDSU	
Ring voltage	80V RMS sine wave
Ringing capability	RSTU3: 3.0 REN per circuit RDSU: 1.5 REN per circuit
RSTU3 Message Waiting voltage	-90 VDC/one telephone per circuit (max.)
RSTU3 modem interface data rate	14,400 bps maximum

3000-series Telephone Option PCBs

Digital telephones can be upgraded with option PCBs to add a number of features. Each of these upgrades shares a circuit with the telephone that it is connected to and is not considered a station. See Table 28 for more information.

Table 28 3000 Telephone Subassembly Upgrades

Subassembly	No. per Phone	Function
BVSU[1]	1	**Speaker Off-hook Call Announce (OCA):** Provides interface for digital telephone to receive Speaker OCA. Not required for Handset/Headset OCA.
BHEU or HHEU	1	**Headset and external ringer telephone interface:** Can be installed with BVSU, BPCI or DADM.
BPCI[1]	1	**Desktop PC Interface for CTI applications.**
DADM3020[1]	1 or 2	**Add-on Module (ADM):** Provides telephone with 20 (or 40 with two ADMs) additional feature buttons.

1. Telephones with the BPCI cannot have Speaker OCA (BVSU) or Add-on modules. Also, DKT3001 telephones cannot have CTI (BPCI), Speaker OCA (BVSU) or Add-on modules.

Station Dimensions

Dimensions for the 3000-series telephones and related station equipment are listed in Table 29.

Table 29 Station Dimensions

Device	Height	Width	Depth
10-button Digital Speakerphone (DKT3010-S)	4.0 inches (101.5 mm)	8.1 inches (205 mm)	9.3 inches (235 mm)
10-button Digital Speakerphone with LCD (DKT3010-SD)	4.0 inches (101.5 mm)	8.1 inches (205 mm)	9.3 inches (235 mm)
20-button Digital Speakerphone (DKT3020-S)	4.0 inches (101.5 mm)	8.1 inches (205 mm)	9.3 inches (235 mm)
20-button Digital Speakerphone with LCD (DKT3020-SD)	4.0 inches (101.5 mm)	8.1 inches (205 mm)	9.3 inches (235 mm)
14-button Digital Speakerphone with Large LCD (DKT3014-SDL)	4.0 inches (101.5 mm)	8.1 inches (205 mm)	9.3 inches (235 mm)

Table 29 Station Dimensions *(continued)*

Device	Height	Width	Depth
Digital Single Line Telephone (DKT3001)	4.0 inches (101.5 mm)	5.9 inches (150 mm)	9.3 inches (235 mm)
Add-on Module (DADM) (3020 model)	3.5 inches (88 mm)	2.8 inches (70 mm)	9.3 inches (235 mm)
Direct Station Selection (DSS) Console (3060 model)	3.5 inches (88 mm)	8.1 inches (205 mm)	9.3 inches (235 mm)
Handset with Handset Cradle (BATHC)	2.9 inches (73 mm)	2.8 inches (71 mm)	9.6 inches (244 mm)
10-button Digital Speakerphone with Handsfree Answerback (DKT2010-S)	4.1 inches (104 mm)	7.7 inches (195 mm)	9.1 inches (230 mm)
10-button Digital Speakerphone with LCD (DKT2010-SD)	4.1 inches (104 mm)	7.7 inches (195 mm)	9.1 inches (230 mm)
20-button Digital Speakerphone (DKT2020-S)	4.1 inches (104 mm)	7.7 inches (195 mm)	9.1 inches (230 mm)
20-button Digital Speakerphone with LCD (DKT2020-SD)	4.1 inches (104 mm)	7.7 inches (195 mm)	9.1 inches (230 mm)
20-button Digital Speakerphone with LCD (DKT2020-FDSP)	4.1 inches (104 mm)	7.7 inches (195 mm)	9.1 inches (230 mm)
Digital Single Line Telephone (DKT2001)	4.2 inches (107 mm)	5.5 inches (140 mm)	9.1 inches (230 mm)
Add-on Module (DADM2020)	3.3 inches (85 mm)	2.8 inches (70 mm)	9.1 inches (230 mm)
Direct Station Selection (DSSS2060) Console	3.3 inches (85 mm)	7.8 inches (199 mm)	9.1 inches (230 mm)
External Speaker Amplifier (HESB)	10.2 inches (260 mm)	10.2 inches (260 mm)	4.9 inches (125 mm)
Door Phone/Lock Control Unit (DDCB)	4.7 inches (120 mm)	6.5 inches (165 mm)	1.5 inches (38 mm)
Door Phone (MDFB)	5.5 inches (140 mm)	3.1 inches (80 mm)	1.3 inches (32 mm)
Attendant Console Interface (BATI)	1.7 inches (42.4 mm)	5.0 inches (126 mm)	7.3 inches (185 mm)
Handset with Handset Cradle (RATHC)	2.8 inches (70 mm)	2.8 inches (70 mm)	9.5 inches (241 mm)
DKT2104-CT Digital Cordless Telephone	**Height**	**Width**	**Depth**
Base (without antenna)	2.5 inches (64 mm)	4.5 inches (115 mm)	7.5 inches (190 mm)
Charger Base	3.25 inches (83 mm)	3.75 inches (95 mm)	4.625 inches (118 mm)
Handset (with antenna)	8.75 inches (222 mm)	2 inches (51 mm)	1.5 inches (38 mm)
Charger Base with handset	9.5 inches (241 mm)	3.75 inches (95 mm)	4.625 inches (118 mm)
DKT2004-CT Digital Cordless Telephone	**Height**	**Width**	**Depth**
Base (without antenna)	3.7 inches (95 mm)	5.0 inches (128 mm)	7.5 inches (190 mm)
Handset (with antenna)	1.1 inches (27 mm)	2.2 inches (55 mm)	8.3 inches (210 mm)
Base with handset (with antennas)	8.7 inches (221 mm)	5.4 inches (137 mm)	8.8 inches (223 mm)

System Tones

Tones which can be heard from speaker or handset are described in Table 30.

Table 30 Call Progress Tones

Tone Name	Conditions	Ringing Cadence
Prime Dial Tone	Prompting to dial [DN] or access code or to press a feature button or to dial 9 + number.	350/440Hz continuously On.
Secondary Dial Tone	Prompting to dial [DN] or access code or to press a feature button, with someone on Consultation Hold.	
DND-Stuttered Dial Tone	Same as Prime Dial Tone with implication of DND activated. MW-Stutter dial tone has priority over this tone.	480/620Hz 0.125 sec. 4 bursts apart 0.125 sec., 350/440Hz 3 sec. On, repeat.
MW-Stuttered Dial Tone	Same as Prime Dial Tone with implication of MW received. This tone has a priority over DND-Stutter dial tone.	350/440Hz 0.1 sec. 5 bursts apart 0.1 sec., 3 sec. On, repeat.
Entry Tone	More digits are required such as account codes, some indexes, etc.	350/440Hz, 0.1 sec. 3 bursts apart 0.1 sec.
Ring Back Tone	Ringing the destination	440/480 Hz 1 sec. On, 3 sec. Off, repeat.
Success Tone (Confirmation Tone)	Operation was successfully accepted.	350/440 Hz, 3 bursts of 0.125 sec., apart 0.125 sec.
Reject Tone	Operation was rejected. After this tone is done, the original conversation is resumed.	1209 Hz 0.25 sec., 500 Hz 0.25 sec., 3 times.
Busy Tone	Destination is busy. Invoke desired feature or retry later.	480/620 Hz, 0.5 sec. On, 0.5 sec. Off, repeat.
Reorder Tone	Either the operation failed or the call is terminated. Hang up.	480/620 Hz, 0.25 sec. On, 0.25 sec. Off, repeat.
DND Tone	The destination is in the Do Not Disturb mode.	480/620 Hz, 0.125 sec. On, 0.125 sec. Off, repeat.
Splash Tone	Voice calling starts. Applicable to Voice Paging and Speaker OCA.	500 Hz, 1.0 sec. On.
Barge-in Warning Tone	Somebody is listening to (monitoring) the conversation.	440 Hz 1.0 sec. On.
External Call Waiting Tone for Standard Telephone	An external call is waiting. This tone is sent to the receive party only.	1209 Hz, 2 bursts of 0.16 sec. apart 0.16 sec., twice, 3 sec. apart.
Internal Call Waiting Tone for Standard Telephone	An internal call is waiting or somebody is listening to (monitoring) the conversation.	1209 Hz, 2 bursts of 0.5 sec. On, apart 3.0 sec.

Ring tones are described, along with their cadences in Table 31. Due to the limitation in the tone generation algorithm, the listed tone duration is slightly different from the actual one.

Table 31 Ring Tones

Tone Name	Description	Ringing Cadence
External Ring 1	Incoming line call from external party (low pitch tone).	500/640 Hz, 1 sec. On, 3 sec. Off, repeat.
External Ring 2	Incoming line call from external party (medium pitch tone).	860/1180 Hz, 1 sec. On, 3 sec. Off, repeat.
External Ring 3	Incoming line call from external party (high pitch tone).	1300/1780 Hz, 1 sec. On, 3 sec. Off, repeat.
External Ring 4	Incoming line call from external party (combined pitch).	860/1180 Hz 0.5 sec. On, 1300/1780 Hz 0.5 sec. On, 3 sec. Off, repeat.
Internal Ring	Incoming call from internal party to DKT.	500 Hz 1sec On, 3 sec. Off, repeat (once, in case of hands free call).
External Ring for Standard Telephone	Incoming call from external party (Rings bell inside standard telephone.)	20 Hz 1 sec. On, 3 sec. Off, repeat.
Internal Ring for Standard Telephone	Incoming call from internal party.	20 Hz 0.4 sec. On, 0.2 sec. Off, 0.4 sec. On, 3 sec. Off, repeat.
Recall	A call is returned and needs to be answered.	2 kHz interrupted at 10 Hz, 1 sec. On, 1 sec. Off, repeat.
Recall for Standard Telephone	A call is returned and needs to be answered.	20 Hz, 1 sec. On, 1 sec. Off, repeat.
Ring Over Busy (Internal)	A call is ringing an idle [DN] or CO line button while the telephone is busy. Another internal call offered to an idle button while the terminal is busy.	2 kHz interrupted at 10 Hz, 1 sec. On, 3 sec. Off, twice or repeat (For Call Waiting, twice only).
Call Waiting (Internal)	An internal call is waiting for the busy button. A call is camped-on to a busy [DN] or CO line button.	
Ring Over Busy (External)	A call is ringing an idle [DN] or CO line button while the telephone is busy. Another incoming call is offered to an idle button while the terminal is busy.	2 kHz interrupted at 10 Hz, 2 bursts of 0.25 sec. apart 0.25 sec., twice apart 3 sec. or continuous (For Call Waiting, twice only).
Call Waiting (External)	An external call is waiting for the busy station. A call is camped-on to a busy [DN] or CO line button.	
Volume Control - Ringing Speaker	To adjust the speaker volume for ringing state.	500/640 Hz continuous.

Other types of tones that do not fit in the previous categories are listed in Table 32.

Table 32 Administration/Programming Tones

Tone Name	Description	Ringing Cadence
Confirmation Tone	During user programming or administration mode, indicates the acceptance of input.	2 kHz two bursts of 0.125 sec. apart 0.125 sec.
Denial Tone	During user programming or administration mode, indicates the denial of input.	2 kHz 0.75 sec. On.
Volume Control - Beep	To adjust the beep volume.	2 kHz interrupted 10 Hz, continuous.

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